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EXPERIMENTS

WITH THE TORSION ROD

FOR DETERMINING

THE MEAN DENSITY OF THE EARTH.

FORMING VOL. XIV. OF
THE MEMOIRS OF THE ROYAL ASTRONOMICAL SOCIETY.

VITTORIO EMANUELE BIBLIOTECA IN ROMA

By FRANCIS BAILY, Esq.
VICE-PRESIDENT OF THE SOCIETY.

LONDON:
PUBLISHED BY THE ROYAL ASTRONOMICAL SOCIETY,
AND SOLD AT THEIR APARTMENTS,
SOMERSET HOUSE.

1843.

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LONDON:
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The present Work forms Volume XIV of the *Memoirs* of the *Royal Astronomical Society*. But the Council of that Society, conceiving that many persons, not in the habit of purchasing those volumes, might be desirous of procuring this Memoir, have caused an extra number of copies to be printed for separate publication.

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OF THE

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ERRATA.

Page 8, line 4, *for* 23 .... *read* 29.

— 12, — 2, *Note.*— On dismantling the pillar I found that the *pivot* and the *cup* were both made of hard wood.

— 12, — 5, *Note.*— The *lower* plank was 2¾ inches thick: see the Note in page 113.

— 17, — 4, *for* 22 .... *read* 21.

— 17, — 17, *for* 14 .... *read* 15.

— 29, — 6, *for* $\frac{\cdot365 + \cdot415}{2}$ .. *read* $\frac{\cdot365 + \cdot465}{2}$.

— 55, — 8, *for* 8·465 ...... *read* 9·465.

— 81, — 4, *for* 5·927 ...... *read* 5·925.

— 86, — 8, *for* 8th .... *read* 9th.

— 87, — 6, *for* 5·49 and 5·87, *read* 5·50 and 5·85.

— 95, — 25,
— 95, — 27, *for* 36·55 ...... *read* 36·35.
— 95, — 28,

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PAPERS.

I. *An Account of some Experiments with the Torsion-rod, for determining the mean Density of the Earth. By* FRANCIS BAILY, *Esq. Vice-President of this Society.*

Read May 13 and June 10, 1842.

§ 1. *Preliminary History and Remarks.*

A KNOWLEDGE of the mean Density of the Earth has always been a subject of considerable interest and inquiry amongst scientific persons: and different modes have, from time to time, been proposed for the determination of this difficult and important question. In the year 1772, Dr. MASKELYNE, then Astronomer Royal, presented a Paper to the Royal Society, in which he first drew the attention of the public in this country to the investigation of the subject, by proposing to try the effect of the attraction of a mountain on the plumb line of a quadrant, or any other astronomical instrument. The following is an extract from the paper here alluded to.

" It will easily be acknowledged that to find a sensible attraction of any " hill, from undoubted experiment, would be a matter of no small curiosity, " would greatly illustrate the theory of gravity, and would make the universal " gravitation of matter, as it were, palpable to every person, and fit to con- " vince those who will yield their assent to nothing but downright experi- " ment. Nor would its uses end here, as it would serve to give us a better " idea of the total mass of the Earth, and the proportional density of the " matter near the surface, compared with the mean density of the whole " Earth. The result of such an uncommon experiment, which I should hope

" would prove successful, would doubtless do honour to the nation where it " was made, and the Society which executed it.

" Sir Isaac Newton gives us the first hint of such an attempt, in his " popular treatise on the *System of the World,* where he remarks ' That a " ' mountain of a hemispherical figure, 3 miles high and 6 broad, will not, by " ' its attraction, draw the plumb line 2 minutes out of the perpendicular.' " It will appear, by a very easy calculation, that such a mountain would " attract the plumb line 1′ 18″ from the perpendicular.

" But, the first attempt of this kind was made by the French academicians, who measured 3 degrees of the meridian near Quito in Peru, and " who endeavoured to find the effect of the attraction of Chimboraço, a " mountain in that neighbourhood, which is elevated near 4 miles above the " sea, though only about 2 miles above the general level of the province of " Quito. By their observations of the altitudes of fixed stars, taken with a " quadrant of 2½ feet radius, they found the quantity of 8″ in favor of the " attraction of the mountain, by a mean of their observations. This indeed " was much less than they expected; but then it is to be considered that " their instrument was too small and imperfect for the purpose; and that " they themselves were subject to great inconveniencies, being sheltered from " the wind and weather by nothing but a common tent, and placed so high " up the mountain as the boundary where the snow begins to lie unmelted " all the year round. And indeed their observations, doubtless owing to " these causes of error, differ greatly from each other, and are therefore " insufficient to prove the reality of an attraction of the mountain Chimboraço, though the general result from them is in favour of it. Accordingly " one of the French gentlemen themselves, M. Bouguer, who drew up the " account of their experiment, expresses his wishes that a like experiment " might be made to find the attraction of a mountain in France or England, " where he thinks some might be found of sufficient bulk for the purpose."

Dr. Maskelyne then proceeds to state that he made inquiries after a proper hill in this country for trying so curious an experiment; and that he had satisfied himself that it was practicable, and likely to be successful. In consequence therefore of these remarks, a Committee was appointed by the Royal Society to consider of a proper mountain on which the experiment should be tried, and of the best means of carrying it into effect: and after considerable research, the Schehallien mountain was selected for the purpose.

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Dr. Maskelyne was chosen to conduct the operations, and the account of his labours is given in the *Phil. Trans.* for 1775. It appears by that statement that the sum of the deviations of the plumb line, produced by the two contrary attractions, was 11·6 seconds: whence he inferred, from a *rough computation* and investigation, that the mean Density of the Earth was about 4 or 5 times greater than that of water. But Dr. Charles Hutton (the late Professor of Mathematics at the Royal Military Academy at Woolwich) was afterwards appointed to reduce all the observations, and to compute the *correct* results therefrom. His Paper on this subject is inserted in the *Phil. Trans.* for 1778, and contains a detail of all the experiments; but I shall here notice only his concluding remarks, which are as follow.

" The whole attraction of the Earth is to the sum of the two contrary " attractions of the hill, as the number 87522720 to 8811$\frac{2}{3}$; that is, as " 9933 to 1 very nearly, on supposition that the density of the matter in " the hill is equal to the mean density of that in the whole Earth.

" But, the Astronomer Royal found, by his observations, that the sum of " the deviations of the plumb line, produced by the two contrary attractions, " was 11·6 seconds. Hence then it is to be inferred that the attraction of " the Earth is actually to the sum of the attractions of the hill, nearly as " radius to the tangent of 11·6 seconds: that is, as 1 to ·000056239, or as " 17781 to 1; or as 17804 to 1 nearly, after allowing for the centrifugal " force arising from the rotation of the Earth about its axis.

" Having now obtained the two results, namely, that which arises from " the actual observations, and that belonging to the computation on the " supposition of an equal density in the two bodies, the two proportions " compared must give the ratio of their densities, which is that of 17804 to " 9933; or 1434 to 800 nearly; or almost as 9 to 5. And so much does " the mean Density of the Earth exceed that of the hill.

" Thus then we have at length obtained the object which we have been " in quest of through the very laborious calculations that have been described " in this paper, and in the survey and measurements from which these " computations were made; namely, the ratio of the mean density of all the " matter in the Earth, in comparison with the density of the matter of which " the hill is composed: and that ratio we have found to be equal to the ratio " of 9 to 5. And, for the reasons before mentioned, it seems we may rest " satisfied that this proportion is obtained to a considerable degree of prox-

" imity, probably to within the 50th part, if not the 100th part of its true " magnitude. Another question, however still arises, namely, what is the " density of the matter in the hill? Is its mean density equal to that of " water, of sand, of clay, of chalk, of stone, or of some of the metals? For, " according to the matter, or different sorts of matter, of which it is formed, " and according as it is constituted with or without large vacuities, its mean " density may be greater or less, and that in a degree which is not certainly " known. A considerable degree of accuracy in this point could perhaps " only be obtained by a close examination of the internal structure of the " hill. And the easiest method of doing this would be to procure holes to " be bored in several parts of it, from the surface to a sufficient depth, after " the manner that is practised in boring holes to the coal mines from the " surface of the ground: for by such operation it is known what kind of " strata the borer is passed through, together with their dimensions and " densities. The proper mean among all these would be the mean density " of the hill as compared to water, or to any other simple matter: and thence " we should obtain the comparative density of the whole Earth with respect " to water. But in the present instance we must be satisfied with the " estimate arising from the report of the external view of the hill: which is, " that, to all appearance, it consists of an entire mass of solid rock. It is " probable therefore that we shall not greatly err if we assume the density of " the hill equal to that of common stone; which is not much different from " the mean density of the whole matter near the surface of the Earth, to " such depths as have actually been explored either by digging or boring. " Now, the density of common stone is to that of rain water as 2½ to 1; " which being compounded with the proportion of 9 to 5 above found, there " results the ratio of 4½ to 1 for the ratio of the densities of the Earth and " rain water: that is to say, the mean Density of the whole Earth is about " 4½ times the density of water."

Thus far Dr. Hutton: but since this calculation has been completed, Mr. Playfair, Professor of Natural Philosophy in the University of Edinburgh, in conjunction with Lord Webb Seymour, made a mineralogical survey of the hill Schehallien, for the express purpose of determining more accurately, from the preceding experiments, the probable mean Density of the Earth. They found that the rock of Schehallien, like that of all the mountains in its vicinity, is of the class called primitive; and that it is disposed, for the most

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part, in great parallel strata, nearly vertical; the inclination differing very little from 15°. The upper part, where the greatest attraction existed, was of granular quartz, extremely hard, compact and homogeneous: the other portions were composed of micaceous and calcareous schistus. From Mr. Playfair's investigations, apparently carried on with great care, it was found that the mean specific gravity of the granular quartz was 2·63988; and of the micaceous and calcareous schist, 2·81039. Two separate calculations were then made: one on the supposition that the rocks were separated by vertical surfaces, and another supposing them to be separated by surfaces nearly horizontal. The former gave for the mean Density of the Earth 4·55886; and the latter 4·86700: the mean is 4·71293.

These investigations of Mr. Playfair are contained in the *Phil. Trans.* for 1811; and Dr. Hutton has, in the 14th volume of his *Abridgment* of the *Phil. Trans.* added to his own Paper, above quoted, the substance of Mr. Playfair's deductions. But, instead of using Mr. Playfair's precise results, he has given them a somewhat increased value, as may be seen from the following extract. " On the whole then it appears not unreasonable to " suppose the mean specific gravity of the mountain to be from 2·70 to " 2·75, or $2\frac{3}{4}$. Now $\frac{9}{5}\times 2\frac{3}{4}$ gives $\frac{99}{20}$, or almost 5: that is, under these cir- " cumstances the medium density, or specific gravity of the whole mass of " the Earth, in proportion to that of water, is nearly as 5 to 1; or that it is " 5 times the weight of water." But Mr. Playfair's decided and expressed opinion was, that, from Dr. Maskelyne's observations, and his own experiments, the density could not exceed 4·867; and that it might be as little as 4·559.

After some further remarks, Dr. Hutton concludes his Paper with a recommendation that the experiment should be repeated, in order to obtain a more satisfactory result. His words are these.

" Thus then we have brought to a conclusion the computation of this " important experiment, and it is hoped with no inconsiderable degree of " accuracy. But, it is the first experiment of the kind which has been so " minutely and circumstantially treated; and first attempts are seldom so " perfect, and just, as succeeding endeavours afterwards render them. And " besides, a frequent repetition of the same experiment, and a coincidence of " results, afford that firm dependance on the conclusions, and satisfaction to " the mind, which can scarcely ever be had from a single trial, however

" carefully it may be executed. For those reasons it is to be wished that " the world may not rest satisfied barely with what has been done in this " instance, but that they will repeat the experiment in other situations and " in other countries, with all the care and precision that it may be possible " to give to it, till an uniformity of conclusions shall be found, sufficient to " establish the point in question beyond any reasonable possibility of doubt."

It would appear therefore from this statement that the determination of the mean Density of the Earth, by this method, is still subject to considerable doubt and uncertainty: and it was probably this circumstance that subsequently induced the Rev. John Michell to suggest another mode of obtaining the same object by means of the *torsion-rod*, about that time invented.* But, as he died before he had time to enter upon the experiments, this ingenious plan was afterwards taken up and pursued by Mr. Cavendish, who has published the result of his labours in the *Phil. Trans.* for 1798. He there gives a brief view of Mr. Michell's plan, and of his own intentions, in the following words.

" The apparatus is very simple; it consists of a wooden arm [the torsion- " rod] 6 feet long, made so as to unite great strength with little weight. " This arm is suspended in a horizontal position by a slender wire 40 inches " long, and to each extremity is hung a leaden ball, about 2 inches in " diameter; and the whole is enclosed in a narrow wooden case, to defend it " from the wind.† As no more force is required to make this arm turn " round on its centre, than what is necessary to twist the suspending wire, it " is plain that, if the wire is sufficiently slender, the most minute force, such " as the attraction of a leaden weight a few inches in diameter, will be " sufficient to draw the arm sensibly aside. The weights, which Mr. Michell " *intended* to use, were 8 inches diameter. One of these was to be placed on " one side the case, opposite to one of the balls, and as near as it could " conveniently be done; and the other on the other side, opposite to the " other ball: so that the attraction of both these weights would conspire in " drawing the arm aside. And when its position, as affected by these " weights, was ascertained, the weights were to be removed to the other side

---

* Mr. Michell says that he had the intention of making and using this instrument, before the publication of Coulomb's experiments.

† Cavendish's apparatus, here alluded to, belongs to the Royal Institution, of whom I borrowed it for the purpose of having copies of its several parts made for my experiments.—F. B.

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" of the case, so as to draw the arm the contrary way; and the position of
" the arm was to be again determined: and consequently half the difference
" of these positions would shew how much the arm was drawn aside by the
" attraction of the weights. In order to determine from hence the Density
" of the Earth, it is necessary to ascertain what force is required to draw the
" arm aside through a given space. This Mr. Michell intended to do by
" putting the arm in motion, and observing the time of its vibrations; from
" which it may easily be computed. * * * * As the force with which
" the balls are attracted by these weights is excessively minute, not more
" than $\frac{1}{50000000}$ of their weight, it is plain that a very minute disturbing force
" will be sufficient to destroy the success of the experiment; and from the
" following experiments it will appear that the disturbing force, most difficult
" to guard against, is that arising from the variations of heat and cold. For,
" if one side of the case is warmer than the other, the air in contact with it
" will be rarefied, and in consequence will ascend; while that on the other
" side will descend and produce a current which will draw the arm sensibly
" aside. As I was convinced of the necessity of guarding against this source
" of error, I resolved to place the apparatus in a room which should remain
" constantly shut, and to observe the motion of the arm from without, by
" means of a telescope; and to suspend the leaden weights in such manner
" that I could move them without entering into the room. This difference
" in the manner of observing, rendered it necessary to make some alteration
" in Mr. Michell's apparatus: and as there were some parts of it, which I
" thought not so convenient as could be wished, I chose to make the greatest
" part of it afresh."

Mr. Cavendish then proceeds to describe the apparatus which he had erected, and to explain his mode of operation, which appears to have been conducted with great judgment and accuracy. Yet notwithstanding the precautions which he had taken, he still met with some anomalies for which he could not satisfactorily account, and which appear to have affected the results rather more than he had anticipated. He made several attempts to elucidate this difficulty; yet although he had evidently hit upon the probable source of the principal anomalies, he does not appear, at that time, to have taken any effectual steps to remove it, but deferred his intention of pursuing this subject, as well as some other improvements in his apparatus, to a future period.

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The number of his experiments is very few; yet, with one exception, they are very accordant, and shew the diligence and care with which they have been made. From 17 sets of experiments (being all that are on record) he deduced 23 results; from the mean of which he computes the Density of the Earth to be equal to 5·45.* Some objection, indeed, may be made to the paucity of his experiments, and to certain parts of his mode of proceeding, to which I shall refer in another place: it is but just, however, here to remark that Cavendish's object in drawing up the Memoir, appears to have been more for the purpose of exhibiting a *specimen* of what he considered to be an excellent method of determining this important inquiry, than of deducing a result that should lay claim to the full confidence of the scientific world. For he himself, in allusion to this very point, distinctly expresses his opinion, in the following passage, towards the conclusion of his remarks.

" It indeed may be objected that as the result appears to be influenced by " the current of air, or some other cause, the laws of which we are not well " acquainted with, this cause may perhaps act always, or commonly, in the " same direction, and thereby make a considerable error in the result. But, " yet, as the experiments were tried in various weathers, and with consi- " derable variety in the difference of temperature of the weights and air, " and with the arm resting at different distances from the sides of the case, it " seems very unlikely that this cause should act so uniformly in the same " way as to make the error of the mean result nearly equal to the difference " between this and the extreme. And therefore it seems very unlikely that " the Density of the Earth should differ from 5·48 by so much as $\frac{1}{14}$ of the " whole. * * * * According to the experiments, made by Dr. Maske- " lyne, on the hill Schehallien, the Density of the Earth is 4½ times that " of water: which differs rather more from the preceding determination than " I should have expected. But I forbear entering into any consideration of " which determination is most to be depended on, till I have examined more " carefully how much the preceding determination is affected by irregularities " whose quantity I cannot measure."

It may be thus clearly seen that Cavendish did not consider the operation as a final measure, but merely as exhibiting an approximate result: and it is evident that he had at that time an intention of pursuing the subject still farther. But as no further account of any subsequent experiments is on record, and as no trace of any new light on this subject can (as I understand) be found amongst CAVENDISH's papers, the propriety and advantage of repeating the experiments, under new circumstances, and with all the improvements of modern artists, has consequently been frequently discussed amongst scientific persons: and in the year 1835 the Council of the Royal Astronomical Society appointed a Committee for the express purpose of considering the subject. No effective steps, however, were taken, even by this body, for carrying the measure into execution till the autumn of the year 1837, when Mr. AIRY, the Astronomer Royal (one of the Vice-Presidents of this Society), applied for, and obtained from his late Majesty's Government, a grant of £500, to defray the expenses of this object.

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* Cavendish says 5·48: but there is a singular error in his computation, to which I shall hereafter allude.

Having offered to undertake the laborious task of making the proposed experiments, and of computing the results, the whole arrangement of the plan, and the entire execution of the work, was placed at my disposal and under my control. But, in this enterprize I was ably assisted by the constant aid and advice of the Astronomer Royal; without whose encouragement and support I should not have ventured to embark in this undertaking.

It is somewhat singular that, whilst this plan was in agitation in this country, a similar course of experiments had been actually undertaken and accomplished by M. REICH, Professor of Natural Philosophy in the Academy of Mines, at Freiberg in Saxony; an account of which was read before the German Scientific Association, which met at Prague in September 1837. The details of these experiments were published in the following year; and a copy of the work was kindly forwarded to me by the Author.* As I shall again have occasion to mention this work, I shall not further here allude to it than by remarking that though the experiments are, on the whole, in good accordance with the general result obtained by CAVENDISH, yet they do not interfere with the plan that this Society had in contemplation: which was not merely to repeat the original experiments of Cavendish in a somewhat similar manner, but also to extend the investigation by varying the magnitude and substance of the attracted balls — by trying the effect of different modes of suspension — by adopting considerable differences of temperature — and by other variations that might be suggested during the progress of the inquiry. Reich made use of *one* mass only, and that much inferior in weight to the *two* adopted by Cavendish. The weight of Reich's large ball was little more than 99 pounds avoirdupois: whilst the two spheres used by Cavendish weighed nearly 700 pounds. Reich's experiments also were (like Cavendish's) too few in number; 57 only having been made, from which 14 results have been deduced; the mean of which makes the Density of the Earth equal to 5·44, almost identical with that of Cavendish.

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* This work is entitled "Versuche über die mittlere Dichtigkeit der Erde, mittelst der Drehwage von F. REICH, Prof. der Physik an der K. S. Bergakademie. Mit 2 lithographirten Tafeln. Freiberg, 1838. Verlag von J. G. Engelhardt." It is a small octavo, containing only 66 pages.

As a great portion of the apparatus, which I had ordered, was at this time actually completed, and the remainder of it in considerable progress, I resolved to proceed in the inquiry, notwithstanding this apparent confirmation of Cavendish's results. Various places were suggested, by different persons, as the most suitable and fit for performing experiments of this kind: but, after inspecting several situations that were proposed, and considering all the circumstances of the case, I at length decided to carry them on at my own house, which is not only the most convenient that I could have selected, but which I have since found to be as suitable and fit as any that could have been specially erected for the express purpose.

§ 2. *Description of the Room.*

The place, therefore, in which the experiments were carried on, is one of the rooms in my residence, No. 37 Tavistock Place; which is the same house as that mentioned in the *Phil. Trans.* for 1832, page 403, and again in the 7th volume of the *Memoirs* of this Society, page 42, where various pendulum experiments therein described were frequently made. The house stands detached from any other building, in a large garden, some distance from the street (which is macadamised), and consists of one story only. The room, above alluded to (which is on the first floor) is at the north-east angle of the house, and has only one window, which faces towards the north: or, more accurately N.N.W. This window has been furnished, for the express purpose of these experiments, with a double glass frame; by which means, any *sudden* change of temperature in the room is most effectually prevented:

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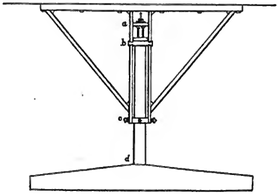
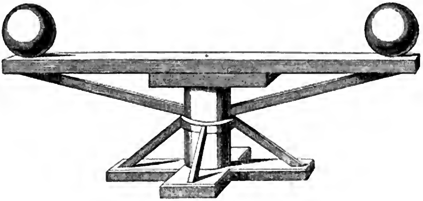
but I had on former occasions always found the temperature here very uniform without such precaution. The inner window has been pasted over with thick brown paper, in order to darken the room, and thus prevent any radiation of heat from the glass; no day-light being at any time admitted, except during the experiments, and then only through an aperture, about one foot square, just sufficient to illuminate a scale of divisions, which will be subsequently described. The chimney also has been stopt up, both at the top, and at the fire place: and it may here be stated that none of the fires in the lower apartments of the house communicate with, or even approach the flue of this chimney: so that all access of heat from such source has been completely cut off. The size of the room is 17 by 14½ feet, and its height is above 9½ feet. On three sides of the room the walls are 14 inches thick; and the fourth side, although not more than 9 inches thick, adjoins a long passage which is very uniform in its temperature.

Above the ceiling of this room, and just below the roof of the house, a very stout plank, 3 inches thick and 9 inches wide, has been fixed on the bearings of the walls (which are here also 14 inches thick); and this plank, by means of several strong iron screw bolts, passing through the ceiling, has been made the firm support of a triangular wooden frame, nearly in the centre of the room, to which is attached a slight mahogany box (hereafter mentioned in page 19), in the shape of the inverted letter T, containing the torsion rod, and the wire by which it is suspended. The lower side of this box is 3 feet 2 inches above the floor of the room. The accompanying wood-cut will represent a front view of the construction of this triangular frame work, and the mahogany box: the back stay of the frame is consequently not here visible. It will be again alluded to and more fully described in page 19.

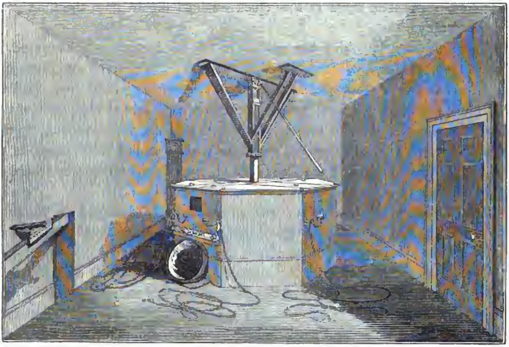


Below the centre of this mahogany box, a solid wooden cross piece has been firmly screwed to the floor, on which has been raised a circular frame work, embracing and supporting a copper ring; within which ring a large round wooden pillar moves on an iron pivot, which bears upon a metal cup. This pillar is 26½ inches long, and 10 inches in diameter. On the top of it is fastened, in a horizontal position, a deal plank 36 inches long, 10 inches wide, and 2½ inches thick; and, on the top of this, another deal plank, of the same width and thickness as the preceding one, and 92½ inches long, is fastened and supported by side arms in order to give it additional strength. This plank supports the two large leaden balls, hereafter described, and which I shall universally designate by the name of the *Masses*, in order to distinguish them more decidedly from the several small balls that were, from time to time, as the experiments were varied, affixed to the torsion rod, and which will be more fully described in a subsequent section. The accompanying wood-cut will best explain the construction of this moveable plank.



The height of this pillar has been so constructed that the centres of the masses should be placed in the same horizontal plane (or nearly so) as that intended to be the plane of the centres of the small balls just alluded to. On the upper surface of the plank, and as nearly as possible in the centre of motion, a round piece of ivory, about one inch in diameter, has been inlaid. The centre of motion having then been accurately determined, two black cross lines were so drawn on the ivory that their point of intersection always indicated its position. These lines are represented in the figure.

A circle, about 8 feet in diameter, was then drawn on the floor round this centre of motion, and an octagonal wooden frame, or screen, 4 feet high, was erected all round the apparatus, and covered in, at the top, in every part, except where an opening was necessary for the vertical shaft of the mahogany box; thus more effectually securing the more delicate portions of the apparatus from the influence of any accidental or sudden change of temperature in the room. And, as a farther security against the transmission of any extraneous temperature, a large piece of thick oil-cloth was spread over the whole of this portion of the floor, prior to the erection of the screen here alluded to: so that no air could be introduced through the crevices of the floor. This wooden screen, which was made of deal, 1½ inch thick, was firmly secured to the floor by means of wooden stays and braces, and thus served also as a convenient support for many of the subordinate parts of the apparatus that were requisite in carrying on the experiments. The upper portion of this screen was furnished with sliding partitions, which could be easily removed for the purpose of obtaining access to the interior. The accompanying wood-cut will shew the general appearance of the triangular support, and of the wooden screen, that encloses the plank which bears the masses. The spectator is here supposed to stand in the recess of the window; the position of which is seen in the wood-cut in page 15.



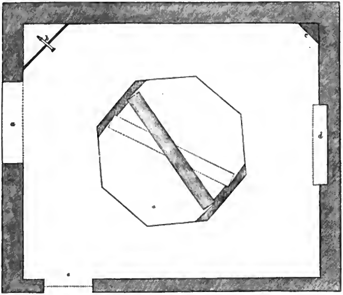
It is scarcely necessary to state that an opening, about 6 inches square, is cut in each of the panels of the screen that are opposite the ends of the torsion rod, for the purpose of observing the motions of the torsion rod with the telescope. These openings are closed with thick plate glass: and, as the ends of the torsion box are also furnished with plate glass, it is evident that the torsion rod was viewed through *two* glasses. The eye-tube of the telescope was furnished with three parallel and vertical spider lines; the centre one of which was always used for determining the march and position of the torsion rod: or, if the side wires were occasionally used, which was not often the case, they were always reduced to the centre by the known difference between them.

In one corner of the room was fixed an excellent *clock* by Molyneux, which I had frequently used, on former occasions, in some pendulum experiments. The loud beats of this clock enabled me to note the time with great accuracy.

The telescope, by which the motion of the torsion rod was observed, is about 11 inches long, and was placed at the N.N.E. corner of the room, and firmly screwed to a stout wooden bar that crossed diagonally from wall to wall: and ropes, 15 feet long, were fastened on each side of both ends of the plank above mentioned, by means of which the plank, and consequently the masses that were placed thereon, could be readily moved from one side to the other, with the greatest ease and facility when the observer was seated at the telescope.

The frame work, or screen, was so constructed and placed that the horizontal portion of the mahogany box, which contains the torsion rod, should lie in a diagonal direction, across the room; this being the most convenient position for observing the motion of the torsion rod with the telescope. The azimuthal position of this part of the box may therefore be considered as about N.N.E. and S.S.W. The accompanying wood-cut represents a ground-plan of the several parts and positions of the apparatus in this room. The octagonal figure, in the middle, shews the relative size and position of the frame work, just alluded to, which incloses the plank that bears the two masses. This plank is here represented in two alternate positions, abutting against the stop mentioned in page 17. With respect to the other portions of the room, *a* denotes the place of the window; *b*, that of the telescope; *c*, that of the clock; *d*, that of the fire place; and *e*, that of the door.

It is evident, from this statement, that my mode of arranging the apparatus is so far different from that of Cavendish and Reich, that whereas they suspended the masses from *above*, and supported the torsion rod from *below*, I have reversed this mode of operation.



The whole of this carpentry was finished by Mr. William Cubitt, the eminent builder, in Gray's Inn Road; and I have reason to be well satisfied with every part of it. The arrangement of the fabric, which is connected with the solid pillar that carries the plank and the masses, is admirably contrived. Nothing can exceed the ease, the steadiness, and the facility with which these large bodies are moved: and during the many thousands of times that they have been turned backwards and forwards, I have never observed the least deviation from the most perfect accuracy. At the final close of all the experiments, the pivot turns as steadily, as freely, and as accurately as at the commencement of the operations.

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§ 3. *The Great Balls, or Masses.*

The Masses are two solid spheres of lead, rather more than 12 inches in diameter.* They were made by the late Mr. Timothy Bramah, the Engineer, at Pimlico. Great pains were taken not only in the casting, to prevent any hollow places, but also in the turning of them, to insure their perfect sphericity: and these requisite points have been accomplished in a most satisfactory manner. In order to secure the solidity of the sphere, a large iron cylinder, of considerable diameter, and *five* feet in length, was formed as a mould for the lead; and the melted lead was forced *upwards* through the bottom of this vessel. The long mass, thus formed, was then cut through at convenient distances, in various places, for the purpose of procuring the required spheres, and of examining the component parts selected, but no air bubbles could be discovered in any of these cylindrical sections: and the weight of the spheres, after they had been formed, shewed that there was no apprehension of any flaw of this kind. When these cylindrical sections had been roughly formed into a spherical figure, they were respectively put into the lathe, and turned and gauged in every direction, in order to give them a truly spherical shape. And from the examination, which I have since made, of both the spheres, not only with a gauge made for the express purpose, but also by microscopical observations of suspended plumb lines abutting against various parts of the circumference (subsequently alluded to), I am convinced of their perfect accuracy for all the required purposes.

Before these masses were brought to my house, they were taken to the Bullion Office of the Bank of England, and by the kindness of Mr. Haggard were weighed in the large and accurate scales of that establishment. As there is a slight difference in the weight of the two masses, I have designated one of them by the letter A, and the other by the letter B. The following are the respective results of two weighings of *each* of them:

$$\left.\begin{array}{l} A = 2665018 \\ B = 2661546 \end{array}\right\} = 2663282 \text{ grains} = 380{\cdot}469 \text{ pounds avoirdupois.}$$

These masses are not marked; but, as they each stand in a wooden cup, or

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* Whenever these large leaden spheres are alluded to they are always designated as the *Masses*, in order to distinguish them from the smaller balls attached to the torsion rod, and thus to prevent confusion of terms.— See page 12.

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saucer, which *is* marked, and from which they cannot be removed (even designedly) without much preparation and great labour, there cannot be any mistake in their identity, even at a very remote distance of time. These saucers are not represented in the woodcut, in page 22.

The mass A is placed and fixed at one end of the plank, and the mass B at an equal distance from the cross piece, or centre, at the other end. The distance between the centre of each mass was found, by an accurate measurement, to be 81⅔ inches: so that the centre of each mass from the centre of motion of the plank may be considered as equal to 40·8335 inches; and this is the distance assumed in the arithmetical computations.

To the side, or panel, of the screen which faces the telescope (and on the *inside*) was affixed a solid piece of hard wood, about 3 inches square and 3½ feet long; and so placed that it was at the same height from the floor as the plank. This piece of hard wood was notched in such a manner that the end of the plank might abut against it, on each side, when it was brought up to the required distance; and I shall therefore call it the *stop*, because it prevented the mass from proceeding any farther. See the figure in page 14. Every portion of this side of the frame work was so firmly secured that the plank might strike very forcibly against this stop, without affecting any part of the apparatus. Great care however was always taken to prevent the occurrence of such a circumstance: and whenever it occurred it has been noted.*

The position of the stop was so placed that when the plank abutted against it, the centre of each mass should be about 11 inches from the nearest point on the zero line of the torsion-rod; this being the mean distance assumed in the computations; and the error arising from any deviation therefrom, in the actual measurements, being easily supplied by a short table of corrections, which will be subsequently noticed.

From the weighings of 4 large pieces of the lead, cut from different parts of the cylinder from which the masses were formed, I found the specific gravity to be 11·35. And the mean weight of the masses being 2663282 grains, the mean diameter ought to be about 12·1 inches. But in order to determine this more accurately, Mr. Bramah furnished me with a circular brass gauge, which would test the diameter of the masses in every direction:

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* The only sensible effect produced by such a violent collision is a slight displacement of the position of the masses, which is immediately detected by the microscopes. It does not affect the motion of the torsion rod.

and Mr. Simms was kind enough to measure four diameters of this gauge, the mean of which he found to be 12·1034 inches. By means of the plumb lines and microscopes, hereafter mentioned, I measured 14 diameters (in various positions) of each mass, and found the mean to be as follows: viz.

$$\left.\begin{array}{l} A = 12{\cdot}1077 \\ B = 12{\cdot}1035 \end{array}\right\} = 12{\cdot}1056 \text{ inches.}$$

But, from this mean we must deduct ·0030, which is the thickness of twice the semidiameter of the tangent plumb lines. I have therefore assumed 12·1026 inches as the true mean diameter of each mass; and consequently the radius equal to 6·0513 inches; which is the quantity employed in the computations.*

§ 4. *The Torsion Box.*

The box, which contains the torsion-rod and its suspending wire, is made of mahogany about $\frac{3}{8}$ of an inch thick; and, as already observed (page 11) is formed somewhat like the inverted letter T. The horizontal portion is $92\frac{1}{4}$ inches long, and 5 inches wide in the inside. The sides, at the two ends, are 5 inches high, and gradually increasing in height towards the middle, where it is 10 inches high, in order to allow room for the bracing wire. In this horizontal portion of the box, the torsion rod is placed, and which I have therefore called the *torsion box*. The two ends, which are 5 inches square, are closed with thick plate glass, for the convenience of observing its motion, without admitting any current of air. At each *end* of the box, a portion of the top, about 8 inches long, is easily removed, when it is requisite to change the balls without disturbing the torsion rod: these lids are then screwed down very tightly. On the *side* of the box, a portion of it can also, in a similar manner, be easily removed, when access is required for the manipulation of any other part of the apparatus in the inside.

A square wooden tube, 3 inches wide in the inside, and about 5 feet long, made of the same mahogany, is firmly fastened by strong brass plates to the middle of this box at the place marked *d* in the figure: and by the solid manner in which the whole is put together, any lateral deviation of the torsion box is effectually prevented. By means of a shoulder (marked *b* in the figure) at the top of the wooden portion of this tube, the whole of the mahogany case is supported by the triangular frame work affixed to the ceiling; and its vertical position is adjusted and retained by means of side screws (marked *c* in the figure) bearing against the frame work. Just above the wooden shoulder, there is a brass tube, about 2 inches in diameter, which is made to slide up and down, for the convenience of easy access to the upper part of the suspension wire (hereafter described) when manipulation there may be required. It abuts against the support of the suspension wire, which is marked *a* in the figure. The suspension wire, here alluded to, passes through the brass cylinder and down this wooden tube, and I shall therefore call it the ***suspension-line tube.***

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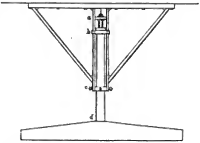
* It may be proper here to remark, for the information of those who may examine the Manuscript books, in which the experiments and computations are recorded, that I have *there* in all cases added 6·0543 inches to the microscope measurements of the distance of the tangents of the masses, in order to obtain the true distance of the centres. For, as the readings of the microscopes, in those measurements, are taken from the *centre* of the plumb lines, it is necessary to add the thickness of the semidiameter of the two lines that are employed in the operation.

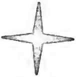


The form of this mahogany box (with the exception of the brass tube at the top, just mentioned) is made precisely after the plan adopted by Cavendish. In fact, the box actually used by Cavendish, and which now belongs to the Royal Institution, was lent to me for the express purpose of procuring a copy of it to be made. The shaft, or tube, at each end of the box, has been omitted in my copy, as it is of no use in my arrangement of the balls, which are screwed to the ends of the torsion rod, and not suspended therefrom by fine wires.

The inside of the torsion box is lined with tin foil, which is connected with a copper wire that communicates with the ground, for the purpose of carrying off any slight electricity that might exist in the box, during any of the experiments. And as it was ultimately found requisite that the interior of the box should be guarded more effectually from the influence of any sudden change of temperature, the whole of it (except the two ends) was covered with a thick flannel coating; and this flannel was then surrounded with another case of thin deal, the two ends of which case, about 20 inches in length, were gilt, and the remaining portions of it, in the middle, covered with gilt paper, to prevent the effect of any radiation of heat. In addition to all this, a thin board, about 15 inches square, covered with baize, was placed at each end and on each side of the torsion box, near the point where the masses approach the box. This additional precaution was taken as a still further guard not only against any radiation of heat from the masses, but also (as the masses are generally brought up to the stop very quickly) to prevent any influence which might be supposed to arise from the current of air produced thereby.

The whole of the mahogany box is completely insulated from every part of the frame work, and from any contact with those portions of the apparatus that are near it. It consequently remains undisturbed either by walking about the floor, by working the masses, or by any other commotion within the room.

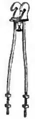
§ 5. *The Torsion Rod.*

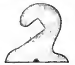


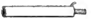
The torsion rod is cut from a piece of fine white deal, 1¼ inch square; and so formed that its shape and size, throughout its whole length, is of the sectional figure in the margin. It is very light, and at the same time extremely strong. I had caused several of them to be made, of various sizes; but I confined the use of them to two only, both of which are of the size above mentioned; one of them being longer, yet lighter, than the other.* In order to prevent any bending of the rod, when the balls are applied at the ends, it was necessary to brace it by means of a wire passing over a fulcrum in the middle.

* Towards the close of my experiments, having detected certain anomalies when the Ivory balls were employed, which I imagined were caused by the weight of the torsion rod, I adopted a much lighter one made of the same material, and in the same form, for a specific class of experiments, in order to ascertain this point; being those recorded in the 53rd Series. The length of the rod was the same as that which had been previously employed, but its weight was only 730 grains: the weight of the two ferrules was 24 grains, and the weight of the bracing wire was 16 grains. So that the total weight was only 770 grains, which is about one third of the weight of the previous rod. As this was used but on one occasion, and only with the ivory balls, I have not considered it necessary to enter into any further explanation in this place.

This fulcrum is of the shape represented in the margin, which is similar to that of Cavendish. It consists of two stout wires, about 5 inches long, the lower ends of which are fastened, by means of counter screws, to a light cross piece of wood attached to the torsion rod, and united at the top by means of a flat piece of brass, shaped, at the sides, into two hooks that form a bed for the roller attached to the lower end of the suspension lines. A side view of the hook, of its real size, is given in the margin. Each end of the torsion rod was cut away, about 2 inches in length, and reduced to a small cylindrical form, in order to be fastened into the tube of a thin brass ferrule, at the extremity of which is a screw, about ½ an inch long, by means of which the balls are attached to the torsion rod. At the shoulder of the screw, a small hook projecting from the ferrule, serves as a pin to which the bracing wire might be easily attached, and disengaged at pleasure. A representation of this ferrule is given in the margin. Nothing can be more convenient than this arrangement. A representation of the whole of the torsion rod and its support, is given in page 27. This plan of attaching the balls close to the ends of the torsion rod, differs essentially from that pursued by Cavendish and Reich, who suspended the balls, in a wooden tube, by means of a long fine wire attached to the ends of the torsion rod.







The weight of the shorter torsion rod is 28¼ grains per inch, and of the longer, 26½ grains per inch. One and the same torsion rod would have answered the purpose in all the experiments; but having during the operations selected the shorter one (as being the strongest) for the 2½-inch lead balls, to which it was afterwards solely appropriated, it is now necessary to discriminate between them. The same kind of bracing wire was always used with both the torsion rods. It was silvered copper wire hardened; its weight was 1·848 grains per inch, and its computed diameter 0·032 inch. The brass ferrule, including the wood which is inserted therein, but excluding the half inch of screw at the end (for a reason which will be afterwards mentioned) weighs 73 grains.* So that each torsion rod may, for all the purposes of this

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* In consequence of the slight additional weight of the brass ferrule, it will be found that the weight of the two inches at each end of the torsion rod, exceeds the mean weight of the torsion rod, by 20 grains: but the allowance for this would not increase the resulting density by more than unity in the fourth place of decimals. It is therefore neglected in the computations.

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inquiry, be considered as of an uniform weight throughout its whole length. Its correct weight, including the bracing wire, but excluding the half inch screw at each end, just alluded to, and the wooden cross piece which supports the fulcrum, was determined by actual weighings at different times, and the *average* weight has been assumed to be as follow:*

The shorter rod (76·75 inches long) = 2370 grains.
The longer rod (77·38 inches long) = 2220 grains.

When the platina balls were used, the longer rod was still further lengthened about ½ an inch, at each end, by the shank which was attached to the *calotte.* See page 26. The weight of each shank was about 25 grains: therefore when the platina balls were used, the weight of the torsion rod has been assumed equal to 2270 grains.

These several determinations of the weights of the torsion rod are exclusive of the brass fulcrum in the centre, and also of the glass mirror which will be hereafter described, together with the small cross piece of wood to which they are both attached. The brass fulcrum, with its screws, weighed 646 grains; the glass mirror, with its frame and screws, weighed 615 grains; and the wooden cross piece weighed 30 grains. So that the total extra parts about the centre of the rod were 1291 grains. These parts however are not taken into account in any of the computations, as they do not affect the results of the experiments.

Whenever I changed the balls, or made any alteration in the disposition of the apparatus, and thus had occasion to re-adjust the position of the torsion rod, I so managed that, when the balls were stationary in the middle of the torsion box, the glass mirror (mentioned in the next section) should reflect the zero line of the division scale nearly in the middle of the field of view of the fixed telescope. This arrangement enabled me to have the advantage of the whole extent of the scale, in case the arc of vibration should be very large; which would frequently occur when the torsion force was small, and the series of experiments continued for a great length of time.

After I had made above 2000 experiments with the light torsion rods here alluded to, and thus had an opportunity of appreciating the respective merits and advantages of each, it was considered desirable to try the influence and effect of a torsion rod of a much greater weight, and bearing a much greater proportion to the weight of the balls employed, and which might even be itself employed without any ball whatever attached thereto. I therefore caused a *brass torsion rod* to be made, about 0·41 inch in diameter, and 77·43 inches long, furnished with a short screw (about $\frac{2}{10}$ of an inch long) at each end, to which a ball might be attached, or not, at pleasure. It was also furnished with a cross piece, and bracing wire, in the same manner as the wooden torsion rods, and was supported by the same fulcrum. The weight of the rod, and its bracing wire, was 22164 grains; and this is the quantity assumed in the arithmetical computations. The cross piece weighed 550 grains.

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* The weight of the torsion rod will vary according to the hygrometrical state of the atmosphere, and will be different in summer and winter. I have sometimes found a difference of 100 grains. CAVENDISH says that his "deal rod when dry weighs 2320 grains, but when very damp "(as it commonly was during the experiments) weighs 2400." This deal rod is now in the possession of the Royal Institution; and in October 1837 I weighed it, and found it only 2297 grains.

§ 6. *The Glass Mirror, and Scale.*

It was my original intention to have pursued Cavendish's method of determining the time, and the arc of vibration of the torsion rod, by means of a light ivory index rod attached to the end of the torsion rod; which, by its passage across the lines cut upon the plate glass at the end of the torsion box and the assistance of the telescope, placed at a distance, would furnish the means of determining these important points. But after continuing this plan for a considerable time, I had reason to suspect that some of the anomalies, which I experienced in the course of my investigations, arose from circumstances connected with this source. I therefore abandoned this method of observing, and finally adopted the plan of using a glass mirror, reflecting its light on a scale of equal parts placed at a considerable distance, as proposed by M. Gauss in magnetical experiments. See Taylor's *Scientific Memoirs*, Vol. II. page 27. The ivory index was consequently removed, and never afterwards employed.

The mirror is exactly 2 inches square, and with its frame and screws weighs 615 grains: it is attached to the torsion rod immediately below its centre. (See the wood-cut in page 27.) It would perhaps have been more convenient if it had been made 2 inches wider, as it would then have reflected the whole length of the scale in the centre of the telescope, when the torsion rod vibrated in very large arcs. But this advantage was supplied by the insertion of *side* wires in the focus of the telescope, as already mentioned in page 15. These side wires however were very seldom used. The scale is formed of a piece of thick silvered brass, 13½ inches long, and 2¾ inches wide; and is fixed on the wooden bar that supports the telescope, and immediately below the tube. Each division of the scale is $\frac{1}{13}$ of an inch: and as the distance from the scale to the centre of motion of the torsion rod is 108 inches, we have $\frac{1}{13 \times 108 \times 2} = \cdot 0003561254 = 73'',46$ for the angle observed at each division of the scale. But, the division lines, which are $1\frac{3}{4}$ inch long, are cut diagonally and subdivided decimally by horizontal lines; so that not only can the tenth of a division be clearly distinguished, but, after some little practice, the fractional parts of these tenths also.

The scale is numbered from 20 to 180; the central point therefore is 100: and, in order to adjust this point to the centre of the telescope, Gauss's method has been adopted of suspending a fine plumb line from the middle of the object end of the telescope, and viewing its reflected image, from the mirror, on the surface of the scale. I call this the *zero* line of the torsion rod: and when the adjustments, for the neutral position of the torsion rod, are made at the commencement of every new set of experiments, the torsion rod is placed as nearly as possible in the middle of the torsion box, and the mirror is so adjusted that the centre wire of the telescope may cut the centre division of the scale, or be at no great distance therefrom. The illumination for the readings of the divisions is obtained by means of a large concave glass mirror, $20\frac{1}{2}$ inches in diameter, which is so placed on the floor and in such a direction, that the day-light from the square opening in the window, alluded to in page 11, falls directly upon the scale, and renders it very luminous. This mirror belongs to the Royal Observatory at Greenwich.

When the masses are brought round to abut against the stop, they always, by their attraction, put the torsion rod in motion; and if this motion, as viewed through the telescope, is in the direction of the readings of the numbers on the scale, the masses are said to be on the *positive* side; but if the motion is in the contrary direction, they are said to be on the *negative* side. In the register of the experiments, these positions are sometimes respectively denoted by the algebraical signs + and −. When the masses are at right angles to the torsion box, and consequently do not exert any influence on the torsion rod, they are said to be in their *neutral* position: and either of the two former positions are sometimes called their *near* position. These terms and designations are merely used for the sake of distinction, and have been borrowed from Cavendish's mode of expression, without intending to imply any arithmetical or analytical operation.

§ 7. *The Balls.*

When I originally commenced the experiments I intended to have occasionally used many balls of different sizes, and formed of different substances,

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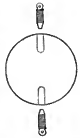
with a view of ascertaining whether the results would be affected by such a variation: and I consequently procured several balls of various kinds to be made. But, having soon found that no very material difference in the results could be discovered in this manner between the metallic balls, I confined my inquiries to experiments made with the following seven kinds of balls: namely, 1° Platina, about 1½ inch in diameter, belonging to the Royal Observatory at Greenwich, and which had been previously used by me in my pendulum experiments, as recorded in the *Phil. Trans.* for 1832, page 408; 2° Lead, 3° Zinc, 4° Glass, 5° Ivory; each about 2 inches in diameter; 6° Lead, 7° hollow Brass; each 2½ inches in diameter. The precise diameter in inches, weight in grains, and specific gravity of each of these several balls are given in the following table:

Substance.	Diameter in inches.	Weight in grains.	Specific Gravity.
Platina	1·472	8957	21·042
Lead	2·060	11941	11·186
Zinc	2·010	7579	7·069
Glass	2·012	3496	3·253
Ivory	2·012	1950	1·813
Lead	2·558	23742	11·338
Hollow Brass..	2·524	8983	

where it is to be understood that the *mean* determination of the two balls of each kind has been taken for the weight of each; which however differed very little from each other.



Each of the 2-inch balls, and also of the 2½-inch lead balls, is tapped with two holes, about ½ an inch deep, as represented in the margin, having a female screw inserted therein. By the means of one of these screw holes, the balls are attached to the ends of the torsion rod; and the other screw hole was intended for the insertion of a light ivory index rod, for determining the time and the arc of vibration, similar to the plan adopted by Cavendish, as already mentioned. Therefore when these balls were weighed, a small brass screw and a small ivory screw were inserted in these holes, in order to complete their true weight, as this is the state in which they were used in the experiments. The brass screw weighed 25 grains, and the ivory screw weighed 5 grains.

Prior to the commencement of the experiments which are placed on record in this work, I abandoned the ivory index, and substituted the glass reflecting mirror, as already related: but in all these subsequent experiments I took care to insert the small ivory screw, in order to complete the computed weight of the ball. The small brass screw was always supplied from the ferrules at the end of the torsion rod, from the assumed weight of which they had been previously deducted, as already mentioned. The hollow brass balls, having been made at a later period of the experiments, were tapped with only one screw hole.

The platina balls could not be tapped, and I consequently caused a light copper *calotte* to be made, the shank of which was about $\frac{1}{2}$ an inch long. Each *calotte* weighed about 55 grains: but, as this included the shank (which should not be reckoned, as it formed part of the assumed weight and length of the torsion rod) we may consider the weight of the *calotte* alone to be about 30 grains for each ball, and which has been adopted and included in the above table. The *calotte* was fastened to the ball by means of thin shell-lac.

The 2-inch and the $2\frac{1}{2}$-inch lead balls were gilt and burnished, in order to prevent any radiation of heat from the surface. The glass balls were also gilt, but not burnished. None of the other balls were gilt; but the platina and the brass had a highly polished surface, which rendered it the less necessary to adopt this plan when they were used.

§ 8. *The Suspension Lines.*

I have adopted two different modes of suspending the torsion rod: one by means of a *single* copper wire, as practised by Cavendish and Reich; the other by means of *double* lines, as proposed by Gauss in magnetic experiments. But I shall, first of all, proceed to describe the construction of the apparatus to which they are respectively attached.

Near the upper end of the triangular wooden frame, alluded to in page 11, and more fully described in page 19, there is inserted a stout wooden shelf (there marked by the letter *a*), having a hole, about an inch in diameter in the centre. Upon the top of this shelf (which is *here* denoted by the letter *d*) is fixed a thick plate of brass, through which passes a short brass

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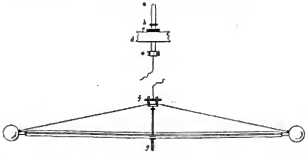
rod, or stem (marked *a*), about 6 inches long and $\frac{3}{10}$ of an inch in diameter, to which the upper part of the suspension line is attached by clamps at the end *e*.*



This plate of brass is capable of being adjusted in any lateral direction, in order that a plumb line, occasionally attached to the brass stem, may be brought directly over the centre of the plank which bears the masses, and thus indicate the correct point of suspension. This being accurately determined, the brass plate is then fastened by thumb screws to the shelf; and, the plumb line being removed, the suspension line is inserted in its place. But previously to the removal of the plumb line, a mark was made on the wall at the end of the room; which, when viewed with the telescope, would be in the same straight line with the plumb line, and consequently indicate any change of position that might occur. During the course of the experiments I frequently examined, by a plumb line, from time to time, the position of this brass stem, but never found that it sensibly differed from its original place: an evident proof of the stability not only of the suspension point, but also of the pillar that supports the plank.

The brass stem is clasped in the middle by a short brass elastic tube (through which it may be raised or lowered) and which firmly pinches and secures it by a circular screw (marked *b*). The outer edge of the brass circle, which is marked *c*, is furnished with rack work that fits into an endless screw, attached to a Hook's joint, having a long handle; whereby the observer is enabled to turn round this stem, and consequently the torsion rod, in any direction. The construction and arrangement of this part of the apparatus is precisely similar to that adopted by Cavendish, and cannot well be improved. In fact, it was made after Cavendish's model, which was lent to me, for that purpose, by the Royal Institution, in whose possession it still remains. The position of the glass mirror is denoted by the letter *g*.

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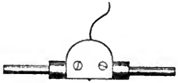
* The suspension line, here alluded to, is, for the sake of convenience, represented in the wood-cut as *divided* in the middle.

Each of the two modes of suspension has been varied in different ways, not only in substance but also in length. With respect to the single copper wires, I have occasionally used them of two different sizes: one whose weight was 0·5564 grain per inch, and whose diameter was consequently estimated at 0·0178 inch; the other whose weight was 0·8353 grain per inch, and whose diameter was consequently estimated at 0·0219 inch. These wires were at the top clamped by screws at the lower end of the brass stem just mentioned; and at the bottom were also clamped by screws in a thick piece of brass, represented in the margin; the projecting ends of which were supported by the hook which forms the upper part of the fulcrum (described in page 20) that is fixed to the centre of the torsion rod. See the letter *f*, in the preceding wood-cut. The total length of the suspension line may be considered as about 60 inches, varying slightly on renewals from time to time, according to accidental circumstances. On one occasion I was desirous of shortening the suspension wire about one third of its length, and therefore attached the upper part of it (thus shortened) to a thick brass tube, 20 inches long and closed at each end, furnished at the bottom with a clipping apparatus to secure the wire. This tube was firmly fastened to the brass stem at the top, and answered the purpose extremely well.*



With respect to the double lines, I used not only silk, but also brass and iron. The two ends of the upper part were fastened to another kind of brass stem, of which I caused two to be made: one of which permitted the distance of the lines to be ·158, and the other, ·365 of an inch. The lower part of the lines passed round a cylinder having a groove in the middle, and projecting arms which were attached to the hook of the torsion

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* The experiments, that were made in this manner, are the 56 which are recorded in the 17th Series. They were not afterwards repeated.

rod, as in the case of the single wire above mentioned. Three of these cylinders were made; each having a groove of a different diameter; viz. ·197, ·369, and ·465 of an inch.[*] It is therefore evident that, in no case, were the lines strictly parallel; but this would not affect the results. The diameters, which have been assumed, are

$$\frac{\cdot 158+\cdot 197}{2}=\cdot 177 \qquad \frac{\cdot 365+\cdot 369}{2}=\cdot 367 \text{ and } \frac{\cdot 365+\cdot 415}{2}=\cdot 415 \text{ inch.}$$

The silk lines were made at Manchester, expressly for my use, and are formed of very fine silk fibres, almost as fine as when first produced by the silk worm. About 30 or 40 of these fibres formed the skeins that were occasionally employed; the fibres were tied together, at every distance of about 6 inches, with threads of fine silk; and, although not weighing more than five grains, were, when doubled, sufficiently strong to support a weight twice as heavy as that attached to the torsion rod. In a few instances I have been obliged to renew these skeins, not only when I have exchanged them for the metal wires, but when in dismounting the torsion rod a few of the fibres might have accidentally been broken, and thus (if suffered to remain) might risk the accuracy of the motion of the torsion rod, by the waving and floating motion of the loose filaments against the sides of the box. Great attention has been always paid to this circumstance when new lines have been employed and put up. In some instances I have doubled the thickness of the skein, without, however, producing any difference in the results.

The brass wire was nealed, and weighed 0·311 grain per inch, and its computed diameter was 0·0134 inch. The iron wire was also nealed, and at first was the finest that I could get that was sufficiently strong to bear the heaviest weight that was likely to be applied, without the risk of stretching or breaking. Its weight was 0·1293 grain per inch, and its computed diameter ·0091 inch. But afterwards having occasion to employ a thicker iron wire, with the brass torsion rod, I procured some where the weight was 0·5153 grain per inch, and its computed diameter 0·0182 inch. This was used only on April 24, 25, and 26, 1842: for being found too thick, I procured another piece, whose weight was 0·4046 grain per inch, and its computed diameter 0·0162 inch, which was the wire subsequently used with the brass torsion rod.

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[*] The second groove, here mentioned, was originally ·395 of an inch; and two sets of experiments were made therewith in June 1841, being those contained in the 18th and 19th Series. But this diameter being found rather too large, it was afterwards reduced to ·369 of an inch.

Before I close this account of the suspension lines, I cannot but advert to the firmness and stability of the support to which they were attached. In order to satisfy myself on this requisite point, at the time of the original construction of the apparatus, I made various attempts to create a sensible disturbance in the motion of the torsion rod, by causing the doors to be frequently and violently slammed—by jumping heavily on the floor of the room—and also *above* the ceiling—and in other different ways, having a similar tendency: but, in no instance could I observe the least effect upon the lateral motion of the rod. I have also frequently tried the same experiment, when different visitors were present, since the apparatus has been completed: and have moreover many times not only accidentally, but also designedly, made a regular series of experiments for determining the Density of the Earth, during the most violent storms that I have ever witnessed, when the wind has been so boisterous, and blowing in such gusts, that the house has been shaken to its centre. But in no instance have I ever seen the least disturbance in the lateral motion of the torsion rod, nor any difference produced in the results of the experiments. I have thought it proper to make these remarks and thus to place them on record, because some persons at first hazarded an opinion that the place which I had selected might not be quite adapted for experiments of so delicate a nature. But a moment's consideration will convince a person conversant with the subject, that no *dancing* motion of the suspension line, even if it did exist, would tend to produce an irregular *lateral* or *angular* motion in the torsion rod; and this is the only anomalous motion we need guard against.*

There is also another remarkable circumstance connected with this subject, which I think it requisite likewise here to place on record. When the torsion rod has been in a state of repose, I have frequently shaken the torsion box, by rapidly moving the ends backward and forward from side to side 50 or 60 times and even more: but I could never discover that this disturbance of the box caused the least motion in the torsion rod, which still

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* On one or two occasions, when a very fine wire and the heaviest balls have been used, I have noticed a slight *trembling* of the torsion rod, when a loaded waggon has been passing the house. But although this motion was closely and designedly watched, I never could discover the least *angular* deviation in the torsion rod. And it may be proper to add that no trembling agitation of this kind took place when violent storms and gusts of wind blew against the house: nor have I since observed the occurrence here alluded to.

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retained its stationary position. This experiment has been witnessed at various times by several scientific persons. Yet, notwithstanding this torpid state of the torsion rod, if the slightest change of temperature be applied near the *side* of the torsion box, or if either *side* near the balls be sprinkled with a little spirit of wine, the torsion rod is immediately put in motion and the resting point undergoes a rapid change.

§ 9. *The Microscopes.*

The distance between the centre of the masses in their alternate *near* positions, has been determined by means of Microscopes, in the following manner. To the central part of the piece of hard wood against which the plank abuts, and which I have called the *stop*, a strong brass plate, of a triangular shape, has been affixed. On the top of this plate, and at the angular part which projects from the panel about 8 inches, there is a small brass tongue, sliding in a groove and capable of being adjusted in position, to which a fine silver plumb line is attached. This plumb line is so adjusted that it may be not only nearly in the centre of the distance between the masses when they are brought up to their near positions; but also at the same time nearly in a straight line with the zero point (100 divisions) of the diagonal scale, and the suspension line of the torsion rod. Moreover, it is so firmly fixed that it almost constantly retains the same position; at least, the slight deviation therefrom, that it may occasionally undergo, is a matter of no importance, since it is immediately discovered, and is easily adjustable. I call this the *zero* line of the masses.

On each side of this zero plumb line, and about 5 inches therefrom, another plumb line is suspended, from the top of the octagonal frame work, or wooden screen, in such a manner that these three plumb lines may be in the straight line that would join the centres of the masses, when they are brought round, from side to side, to abut against the stop. The distance of the outer plumb lines from the centre one has been so chosen that it may be somewhat greater than the truth; in order that the masses, when they are brought to abut against the stop, should abut also against the plumb lines, and thus exhibit the correct distance between the zero plumb line, and the outer circumference of the masses observed. In order to measure this distance with accuracy, a stout brass bar was firmly screwed (with *one* screw only) to the outside panel of the frame work, about 2 feet above the floor;

and to this bar 3 microscopes, each 8½ inches long, were also firmly screwed, and capable of being adjusted so as to be about 5 inches from each other. The object-glass of the microscopes was $\frac{1}{10}$ of an inch; and in the eye piece was fixed a mother-of-pearl scale, each division on which was equal to ·001613 inch. The field of view of the microscopes takes in upwards of 90 divisions of the scale: and by observing and registering the division that is cut by the plumb line, the correct distance of the wires from each other is readily obtained.*

The observations of the distance have been made in the course of every experiment, except in a very few instances where there has not been sufficient time to complete them: a note of such omissions has, however, always been made. In fact, the differences, from one experiment to another, are in general so very minute that no error is likely to occur from this source. Moreover, the bar was not only at the commencement of these experiments, but has subsequently been frequently taken off, and the positions of the microscopes compared with a standard scale in my possession, and which is the same that is described in the 9th volume of the *Memoirs* of this Society, pages 87 and 184. The differences between these comparisons, at various periods, were always extremely small; but I have nevertheless assumed the *mean* of the comparisons as the correct position of the microscopes during the interval. The bar is represented in the wood-cut, in page 13.

As all these plumb lines are suspended in the interior of the frame work, where every thing is in darkness, a small piece of looking glass, about 2 inches square, is placed opposite to each, and adjusted in such a manner that it may reflect, upon the object end of the microscope, the light of a lamp that is applied to a small glass window at the side, during the short time that elapses whilst the observation is made, and which is then immediately removed.

I have here spoken of one microscopic bar only, and one set of plumb lines: but it must be understood that there is a similar arrangement at the opposite end of the frame work, in order to measure the distance of the masses when they arrive at that end of the plank also. The bar which is placed at the northern end of the frame work is designated and marked by the letter A; and that at the southern end, by the letter B.

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* The *middle* of the plumb line was always the point observed and registered: consequently it is requisite that twice the semidiameter of the plumb line should be added to the sum of the distances from the centre wire, in order to obtain the correct distance between the circumferences of the two masses. See the Note in page 18.

I would also remark that although I have hitherto alluded to only three microscopes, there are in fact *five* microscopes on each bar: the two outer ones, which are about 12 inches from the next adjoining ones, being intended for the measurement of the diameter of the masses when required; and consequently used only on such special occasions. The arrangement of the microscopes, therefore, is in the following numerical order,

$$\overset{1}{O}\qquad\qquad\overset{2}{O}\quad\overset{3}{O}\quad\overset{4}{O}\qquad\qquad\overset{5}{O}$$

the three middle ones (2, 3, 4) being the only microscopes that were used in the general experiments for determining the density.

I have already remarked that the differences in the readings of these microscopes, from one experiment to another, are generally very minute. This circumstance enables me to take the mean of the readings of the several microscopes for *all* the experiments made in the same day, without the least risk of any perceptible error, a plan which I have adopted throughout the whole of the experiments; separating, however, the results obtained when the masses were on the positive side, from those which were obtained when they were on the negative side, but adopting the *mean* of them in the computations. It has not therefore been considered necessary to crowd Table I by the insertion of *every* observation of the microscopes: but all the several *mean* results are recorded in Table II in the proper columns.

§ 10. *The Thermometers.*

As it was one of my first considerations to secure an uniform temperature in the room, I was desirous of being able to inspect, from time to time, its actual and correct state. I therefore caused 14 thermometers, of different kinds, to be placed in various parts of the chamber. Two of these formed what is called Six's (or the self registering) thermometer, which indicated and recorded the change of temperature from day to day: six were placed at various distances within the frame work that enclosed the plank, &c., and were so arranged that they could very conveniently be taken out and inspected, without disturbing any part of the apparatus: another was placed against the wall near the window; another also against the wall farthest from the window; another attached to the frame work near the ceiling;

another between the two window frames. These were nearly all of the same length, about 12 inches for 100°, and were divided into half degrees. Besides these there were two shorter ones (4 inches long) placed within the torsion box, one at each end: but, as these seldom indicated any change of temperature during the time of experimenting, I eventually omitted to record them. The last thermometer that I shall mention, was placed near the window, on the outside of the building, in the open air. These are all Fahrenheit's thermometers.

A daily inspection of these thermometers confirmed me in my opinion of the stability of the temperature of this room, wherein I had so often, on former occasions, carried on numerous pendulum experiments. And the frequent comparison of the state of three of these thermometers, namely, that in the open air, that between the two window frames, and that within the room next to the window, proved to me that a very considerable alteration in the temperature of the open air might take place, and continue for a very long time, before it would materially affect the temperature within the *room;* still longer before it reached the interior of the *frame work;* and still longer before it would enter the *torsion box;* where alone it could be attended with any sensible effect on the results. Indeed, in many instances I have completed a series of experiments, when the temperature of the external air has been frequently six, eight, and sometimes more than ten degrees different from that of the room (*plus* or *minus*), without any other change than such as occurs on ordinary occasions; and in some few cases, without any perceptible change whatever.

It was my constant practice, before commencing any set of experiments, to examine and record the state of all the thermometers; and again also at the end of the set. But, it is to those only which are placed within the frame work, that great attention need be paid; as it is there alone that a change of temperature is likely to be the harbinger of any sensible alteration in the torsion box. And in Table I at the end of this memoir, I have inserted the mean of these six thermometers, at the beginning and end of every series of experiments; whereby it will be seen that no great alteration in the temperature ever occurs. Indeed, with a view to satisfy myself of the usual or probable amount of the change of temperature during a set of experiments, I examined the recorded state of the six thermometers within the frame work, consecutively for the period of 14 months; and I found that the mean increase of temperature (as indicated by those thermometers) has been only 0°·15 per hour. Now, when it is considered that I am always obliged to remain in the room during the whole time of any experiments, and that a lamp is occasionally necessary for observing the microscopes, this change of temperature is of no great amount; nor indeed does it produce any anomalous effect on the motion of the torsion rod. For I have generally noticed that anomalies arising from this source seldom occur except when *sudden* changes of temperature are produced in the torsion box; and then only when one side of the torsion box is more affected than the other, which seldom occurs in the ordinary state of the atmosphere.

The Barometer employed is an excellent one made by Newman: its diameter is 0·45 inch. The height of the mercury is recorded exactly as it has been read off, without any correction whatever. It has always been observed at the beginning and end of every series of experiments; and the results are stated in Table I.

§ 11. *The First Series of Experiments* (*since abandoned*).

Before I enter upon the mode which I finally adopted for carrying on the proposed experiments (recorded in this paper) with a view to their accurate results, it will be requisite to describe certain portions of the process which I, at first, pursued for some time, but which I was ultimately obliged to abandon and reject, for reasons which will subsequently fully appear. This relates principally to the uncovered or unprotected state of the torsion box, and its consequent inability to prevent the introduction of a very considerable source of anomaly. I have already stated that Cavendish's torsion box was similar to the one which I have described in page 19; with this exception that his box was furnished with a wooden shaft or trunk at each end, in which the balls were suspended by a fine wire from the ends of the torsion rod: and if I understand Reich's account correctly, his torsion box was not materially different. In both cases the masses were brought up almost *close* to the outer side of this wooden shaft, but without actually touching it: but no mention is made of the application of any intervening substance to guard against a change of temperature on the approach of the masses. Such an occurrence indeed does not appear to have been originally anticipated; and when suspected was not considered of any considerable importance. The principal precaution, which both Cavendish and Reich adopted in the pursuit of their experiments, was to select a *room* where the air might be considered to be generally in a state of uniform temperature during the time of conducting the operations: for it was not probable that any place could be found where the temperature was likely to continue strictly uniform for any long period.

Cavendish chose an out-house in his garden, at Clapham Common; and, having constructed his apparatus *within* the building, he moved the masses by means of ropes passing through a hole in the wall, and observed the motions of the torsion rod, by means of a telescope fixed in an ante-room on the *outside*. The general temperature of the interior was therefore probably uniform during the time that he was occupied in any one set of experiments: but it is scarcely to be expected that a building of this kind, and in such a situation, would preserve the same uniform temperature for 24 successive hours; especially at the seasons (April, May, August, and September) which he selected for his operations.

Reich pursued a similar plan, but under circumstances apparently more favorable; for he selected a dark cellar, where the temperature was not so likely to be disturbed: and, having closed up the door, he adopted Cavendish's plan of observing the motions of the torsion rod, on the outside. But, even in a situation like this, we must not expect a constant uniformity of temperature for a long period. Neither of these authors, however, has given any information on this subject; for, the state of the thermometer (even if any were used) is not once mentioned, except in the three special experiments of Cavendish, to which I am now about to allude.

Both of these experimentalists, in the pursuit of their inquiries, met with anomalies for which they could not satisfactorily account: and although Cavendish suspected the cause of some of those anomalies, and even undertook a few experiments (the three just mentioned) for the express purpose of discovering it, yet he does not appear, either then or at any future time, to have pursued the subject further, nor to have applied any remedy for the evil, in any of his subsequent experiments. He closes the account of his thermometrical experiments with the following laconic remark: "It seems "sufficiently proved therefore that the effect in question is produced by the "difference of temperature between the weights and the case." He probably considered that the amount of the disturbing force, although very sensible when tried in the extreme cases which he pursued, yet under the ordinary circumstances of temperature, was too minute to lead to any material error in the results, and therefore abandoned the attempt to remove it: for he says, " It indeed may be objected that, as the result appears to be influenced " by the current of air, or some other cause, the laws of which we are not " well acquainted with, this cause may perhaps act always, or commonly, in " the same direction, and thereby make a considerable error in the result. " But, yet, as the experiments were tried in various weathers, and with con- " siderable variety in the difference of temperature of the weights and air, " and with the arm resting at different distances from the sides of the case, " it seems very unlikely that this cause should act so uniformly in the same " way, as to make the error of the mean result nearly equal to the difference " between this and the extreme; and therefore it seems very unlikely that " the Density of the Earth should differ from 5·48 by so much as $\frac{1}{14}$ of the " whole." Had Cavendish however increased the number of his experiments, he would soon have discovered the error of his opinion, and that it would be absolutely necessary to remove altogether, or at least to modify, this disturbing force, before he could place any dependance on the result of his labors.

Although Reich pursued his experiments in a room which was rather more favorably situate than the out-house of Cavendish, yet it appears that this distinguished experimentalist also experienced anomalies, for which he has not given any satisfactory explanation. Indeed, he does not describe the nature of those anomalies, nor does he allude either to Cavendish's doubts or to his theory: in fact, it would not appear, if we were to confine our attention merely to his 14 sets of experiments, that he encountered any anomalies at all; since the recorded experiments bear evidence of great regularity and accuracy. But, at the end of his work, page 63, in allusion to certain variations, in the *time* of the oscillations of the torsion rod, which occasionally occurred, he justly remarks that such variations do not affect the results of the experiments, because the deviation of the torsion rod increases, or diminishes, nearly in the same ratio. He then subjoins the following passage, which bears upon the other point in question, to which I am desirous of drawing the attention of the reader: " Totally different from these gradually " progressive changes in the times of vibration, and also easily to be dis- " tinguished therefrom, were the *still much greater anomalies* that were " *occasionally* observed; and which were produced by a small obstruction

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“ that was opposed to the vibrating arm. It is probable that small hairs, or
“ filaments caused by foulness, had introduced themselves into the narrow
“ case, and which immediately produced much shorter periods of vibration,
“ greater irregularities in them, and a rapid decrease of the arc of vibration.
“ *Whenever* this happened the case was carefully cleaned: that is to say, all
“ the filaments that were in the narrow tube, through which the wire that
“ supported the balls passed, were destroyed by means of a burning flame
“ passed through it.”[*] Now, it is difficult to understand how these *occasional* interruptions could have taken place at such short intervals, after the tube had been once properly cleaned and closed: and as no other allusion to such disturbances has been made in the account of the experiments that appear in the book, not only a doubt naturally arises as to the nature and magnitude of the anomalies, and the precise manner in which the results were affected, but a suspicion also is entertained that some of the experiments, thus alluded to, may have been rejected on account of their presumed discordance.

But, however this may be, it is quite clear that both these experimentalists met with certain disturbing forces, in the progress of their inquiries, for the cause of which they could not satisfactorily account, nor for the remedy of which did they make any successful attempt: but, against which it has become very requisite that every precaution should be taken, in the pursuit of any new experiments. Agreeing therefore in Cavendish's view of the subject, that one great cause of some of the anomalies arose from the difference between the temperature of the masses, and that of the circumambient air, I at first caused the stop (alluded to in page 17) to be so placed as to prevent the surface of the masses from approaching nearer to the torsion box than about one inch; conceiving that this increased distance would be a sufficient protection. And as an additional remedy, I introduced, in this intermediate space, at each end and on each side of the torsion box, a thin board about 15 inches square, covered with baize, with a view to prevent as much as possible the transmission of any heat from one body to another. Having adopted these precautions, I commenced the experiments on October 19th, 1838, and registered every observation, that I subsequently made, in printed blank forms, previously prepared.

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[*] Lest I may have inadvertently translated this passage erroneously, I shall here give the original words. “Von diesen allmälig fortschreitenden Veränderungen der Schwingungszeiten
“ ganz verschieden, und auch leicht davon zu unterscheiden, sind die einige Male bemerkten
“ noch weit grössern Anomalien, die durch ein kleines Hinderniss hervorgebracht wurden, das
“ sich dem schwingenden Arme entgegenstellte. In dem engen Gehäuse hatten sich vermuthlich
“ feine Härchen, oder durch Fäulniss gebildete Fäden eingefunden, die sogleich viel kleinere
“ Schwingungszeiten, grosse Unregelmässigkeiten darin, und schnelles Abnehmen der Schwing-
“ ungsbögen bewirkten. In solchem Falle wurde das Gehäuse sorgfältig gereinigt, namentlich
“ wurden in den engen Röhren, durch welche die die Kugeln tragenden Drähte gingen, alle
“ Fäserchen mittelst eines durchgeschobenen brennenden Lichtes zerstört.”

My first experiments were tolerably regular, although the results were generally greater than those obtained either by Cavendish or Reich; but I soon observed discrepancies which convinced me that some disturbing force was in operation, which I had not yet contemplated, and which I could not discover. One of the most striking evidences of such anomaly was the remarkable circumstance that the arc of vibration, during one and the same experiment, would seldom decrease in the regular manner which it ought to pursue, if the torsion rod were guided by an uniform influence; and moreover, that in fact it would frequently *in*crease, contrary to all the known laws of bodies so circumstanced. I also remarked the same generally *increasing* tendency of the resting point of the torsion rod towards the masses, when they were brought round to their *near* position;* a circumstance which had been observed by Cavendish, and which led to his thermometrical experiments, already alluded to. But, totally different from either of these, and not to be explained on the same principle, was the frequent *spontaneous* motion of the torsion rod, when the masses were remaining in their *neutral* position, where they could not exert any influence. I do not here refer to the slight vibratory motion, to which the torsion rod is almost always subject; for even when it is apparently in a state of complete repose, minute vibrations are perceptible with the telescope: but I mean to advert to those occasional and more extraordinary movements in the arc of vibration, which would frequently occur without any apparent cause. In these cases the *time* of vibration would seldom differ from its mean period, and the *resting point* would seldom vary from its usual position: but the arc would increase, from little or nothing, to a very considerable magnitude, and in some instances to such a degree that the balls would strike against the sides of the torsion box. After continuing for some time in this oscillatory condition the arc would gradually decrease, and the torsion rod would ultimately recover its usual state of repose. These phenomena are the more remarkable, since in most of them, during the whole period, the weather has been generally very calm; and as to the temperature, I have seldom been able to discover any material change in the thermometers distributed about the room.

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* I call that position of the masses the *near* position, when they are brought round, on either side (whether positive or negative) to abut nearly against the end of the torsion box: and the *neutral* position is when they are placed nearly at right angles to the torsion box. See page 24.

Notwithstanding these interruptions I not only considered it proper to continue the experiments, for some time, in the usual manner, in the hope that I might thereby eventually throw some light on the probable cause of the anomalies, and perhaps be enabled to apply a correction for the effect of their influence; but also was induced to institute several new courses of experiments, as circumstances and suggestions occurred, for the express purpose of elucidating the subject. The theories of electricity, magnetism, temperature, and currents of air—the influence of different modes of suspension by single and double wires and by double silk lines—the trial of balls composed of different substances and magnitudes—were successively and frequently appealed to, and various experiments made to discover their probable effect on the results. At one time it seemed that a portion of the anomalies might be accounted for by a presumed electric state of the glasses at the ends of the torsion box, on which the divisions of the scale were cut, and close to which the index of the torsion rod moved. I therefore removed the index piece altogether, and substituted a glass mirror fixed in the centre of the torsion rod, as already mentioned in page 23. But this new plan, although much superior in principle to the former mode of observing, did not throw any light on the subject of inquiry, and disappointed my expectations in this respect. The mode of conducting the experiments was also varied in different ways, with a view of eliciting information on the point in question. Some of them were carried on like those of CAVENDISH, and others like those of REICH (for the methods of these two experimentalists were very different from each other, as I shall have occasion to mention again more at large), whilst many more were conducted on a plan essentially different from either of them. Red-hot balls, and powerful lamps, were occasionally applied near the torsion box, with a view to raise an artificial temperature, and thus create a powerful influence: and, on the other hand, masses of ice have been employed for a similar purpose. The manner likewise of putting the masses in motion was frequently diversified, under the hope of being enabled thereby to obtain a clue to the object of my research.

But, it is needless to proceed with a detail of these fruitless operations, which were carried on, without much interruption, for upwards of 18 months, and amounted in number to nearly 1300 experiments. Many of these were of a mere speculative nature, with a view to discover the cause of the anomalies here alluded to : but a thousand of them, at least, were more specially made for the purpose of determining the Density of the Earth, and were eventually reduced. But the results, although in many cases very consistent amongst themselves, were upon the whole so discordant and unsatisfactory, that no confidence could be placed on the general result, as a correct value of the true object of inquiry. And, as I had predetermined not to select merely those experiments which might appear to be the most favorable specimens, or supporting any particular theory, and to keep out of view, and reject the rest, I consequently abandoned the *whole*.

During these investigations I was frequently visited by several scientific persons who took a lively interest in the pursuit in which I was engaged, and who assisted me with their opinion and advice on several occasions; and of which I availed myself, from time to time, as opportunities occurred. But I am principally indebted to Professor FORBES of Edinburgh, for the most satisfactory removal of the principal anomalies that I had met with. This gentleman's intimate acquaintance with the theory of heat, and its various operations, effects, and influence, led him to agree with CAVENDISH in opinion that one source, at least, of the anomalies might arise from the *radiation of heat* from the masses, when they were brought up to the sides of the torsion box : and that this might even still operate notwithstanding the interposition of the sides of the box, and the intermediate boards already alluded to. As a remedy for this influence he suggested the propriety of having the masses *gilt*, and also of procuring a *gilt case* as a cover to the torsion box, for the purpose of preventing the effect of radiation, from whatever source it might arise. Acting upon this advice, I not only caused a gilt case to be made in the manner here proposed, but also caused the torsion box itself to be previously covered, all over, with thick flannel.* The masses, and the plank on

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* This case consisted of four parts : the two ends (each about 20 inches long) were gilt and burnished in the usual manner: but the two middle portions were merely covered with gilt paper.

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which they were placed, were not gilt, as such an operation would be attended with some difficulty and inconvenience, but they were covered with gilt paper, and the whole of the interior of the frame work was lined in a similar manner: but the 2-inch and 2½-inch leaden balls, occasionally attached to the torsion rod, were gilt and burnished. And for the purpose of more effectually preventing the radiant influence of the masses, I altered the position of the stop, so as to increase their distance from the torsion box, about 1½ inch more on each side. The suspension line tube was not meddled with.

These alterations and improvements having been completed, I resolved to commence a *new series* of experiments, that were likely to be thus made under more favorable auspices, for the correct determination of the mean Density of the Earth: and I am happy to state that the results soon convinced me that the proper mode had been taken for the removal of the principal source of discordance. For, although, in some cases, slight discrepancies may still appear to exist, as might be expected in any inquiry that involves so delicate a system of operations; yet where the discordances are of greater magnitude they seem to be confined to one class of experiments, and to depend principally on the nature and construction of the material of which the suspension line or torsion rod is composed, and do not materially affect the general result of the whole. In fact, I have met with very few experiments, made in the regular mode of proceeding, that are objectionable, or that need be rejected on account of any anomaly properly so called.[*] Every experiment therefore that has been made, under this new arrangement of the apparatus (whether good, bad, or indifferent) has been recorded and preserved; and they are *all* here given, in Table I, without any reserve whatever: it being left to the reader himself to reject or retain, at his pleasure, such as he may think fit.

The alterations in the apparatus, here alluded to, necessarily occupied some time: and as I was desirous of previously ascertaining that every part of it was in good and working order, and properly arranged, it was near the close of the month of January 1841, before I was enabled to commence the new series. As the state and condition of the apparatus, thus altered, has been already described in the preceding sections, it is unnecessary here to enter into any further details on that subject. But, as it will be requisite to say something of the mode of proceeding, of conducting the experiments, and of deducing the results, I shall previously enter a little more at large on these points.

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[*] I have already mentioned, in page 39, that the most striking evidence of a disturbing force was the irregularity in the magnitude of the arc of vibration; which has however now been removed by the alterations here alluded to. In order to satisfy myself that these alterations were the true cause of the removal, I have several times stripped the torsion box of its coverings, and commenced experiments in that state; but I have always been obliged to abandon them in consequence of the irregular influence of the masses on the arc of vibration, on whichever side they were brought up.

§ 12. *The Resting Point of the Torsion Rod.*

The torsion rod is never at absolute rest, but is constantly in a state of vibration on its centre; and consequently when the end of it is viewed at a distance with the telescope, it appears to oscillate on each side of a mean point, called the *resting point.* For, even when it is apparently in a state of complete repose, minute vibrations are always perceptible with the telescope; and the times of performing such infinitesimal arcs correspond, in most cases, very nearly with the mean time of vibration that takes place when the torsion rod is in full action.

This resting point, however, is by no means permanent or stationary, and seldom remains in the same position for any length of time, even when the torsion rod is not influenced by the approach of the masses. The extent and direction of its disturbance, as well as its rate of motion when so disturbed, are very variable, and seem to depend on causes which have not been sufficiently accounted for, but which may in some measure arise either from slight changes of temperature, or some latent alteration in the component parts of the suspension line. When the torsion rod is suspended by *double* lines, the motion of the resting point (when it has a tendency to move, which is not always the case) is of an oscillatory nature, and seldom extends to any great distance from the mean zero point; after which it again eventually returns; and so on successively, backwards and forwards, at irregular intervals. But when the torsion rod is suspended by a *single* wire, the motion of the resting point is more direct, yet still of a complicated nature. For there is a general tendency in all hardened wires to turn in a particular direction; which direction however is oftentimes influenced (like the bifilar suspension) by a change of temperature or some other force: so that a sort of compound motion is occasioned, which, though of a vibratory nature, is mostly in one and the same direction; and the resting point of the torsion rod consequently deviates, day after day, considerably from its previous position. In such cases the torsion rod, if it has moved too far from the centre of the torsion box, may be brought back to its required position by means of the Hook's joint.

These vibratory motions of the resting point (which must be carefully distinguished from the regular vibratory changes in the position of the torsion rod itself, caused by the near approach of the masses) do not materially affect the mean results in a series of experiments: more especially if their march be regular. It is only when any sudden and considerable transition takes place, that a sensible and material error is likely to occur: this however seldom happens if due precaution has been taken to screen the torsion box effectually. It must be confessed, however, that discordances sometimes arise which cannot wholly be attributed to change of temperature, but to some other occult influence with which we are at present unacquainted.

Notwithstanding I have assumed that the torsion rod is always in motion, its resting point (or position in which it would repose if its oscillatory motion were to cease) may nevertheless be determined with considerable accuracy by observing two extreme points of the arc of vibration, by means of the telescope, as denoted by the readings of the divisions of the scale: for, half the sum of the two readings will be the required position of the resting point, or sufficiently near it for our present object of inquiry. But, as the resting point itself is generally in motion also, and as two vibrations at least are requisite in order to determine the *time*, it becomes necessary to observe more than two extreme points, when we wish to obtain the mean resting point corresponding to such interval. Cavendish observed *three* extreme points, and took the *second mean* of the whole; whereas Reich observed *four* extreme points, and took the *third mean* of the whole, for the correct mean position of the resting point, corresponding to the interval. The latter is by far the most convenient, not only because four extreme points (at least) are required, when a series of experiments is undertaken, but also because it furnishes a very ready and easy method of determining the time of the mean vibration of the three arcs, without the labour of much computation; as I shall again mention in the sequel. And as both methods are equally correct, I have consequently followed Reich's mode in all my experiments, and have adverted to the use of CAVENDISH's method of reduction on some special occasions only, which are noted at the time.*

Let us now suppose the masses to be in their neutral position, and the torsion rod, in a state of repose, in its neutral position also. The resting point of the torsion rod being noted and recorded, let the masses then be brought up to their near position (either positive or negative), and there suffered to remain during the experiment. The balls are immediately attracted thereby, and the torsion rod consequently moves towards the masses, and takes up a new position. The velocity of this motion and the delicacy of the suspension lines cause it at first to advance beyond its correct position; but it is soon brought back again by the torsion force of the suspension lines; and thus a vibratory motion arises about a *new* resting point, which (if undisturbed) would continue for some time. The place of this new resting point is ascertained in the same manner as that just alluded to: and the difference between the two positions thus determined will give the *Deviation*, or mean arc, through which the torsion rod has been moved by the influence of the masses; and this deviation is the most important of all the quantities that are requisite for the solution of the problem in question.

But, where a series of experiments is intended to be made, I have not taken any account of the position of the *resting point* of the torsion rod when the masses are in their *neutral* position, but have always commenced indiscriminately when the torsion rod has come to its *extreme point*, on whichever side the masses might be at the time, or even if in their neutral position: and as soon as the first experiment is completed I have brought the masses *quickly* round to the other side of the torsion box, when the balls are again attracted, but in the opposite direction. A similar vibratory motion takes place also here, and another new resting point likewise occurs, on *that* side of the torsion box, the mean place of which is ascertained in the same manner as the former. The difference between the mean places of these two new resting points will give the total mean arc through which the torsion rod has been moved by the influence of the masses in their positive and negative situations, or in their two *near* positions: the *half* of which is here the correct deviation from the mean neutral position of the torsion rod.

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* These special occasions are only 9 in number, and are the binary experiments, Nos. (83 and 84), (99 and 100), (109 and 110), (121 and 122), (177 and 178), (188 and 189), (282 and 283), (1513 and 1514), (1848 and 1849).

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This experiment being completed, another may be immediately commenced in a similar manner, and continued from the preceding one by bringing the masses round *quickly* again to the other side; and so on, successively as long as it may be convenient: and it will be found that the mean positions of each of these new resting points will either continue tolerably regular during the whole of the series, or will move in the same direction with considerable uniformity. The slight irregular deviations therefrom are, however, occurrences against which it is of the greatest importance to guard as effectually as possible, since they are the source of the most considerable error that arises in the results.

But, should any sudden and considerable change take place in the direction of the march of the resting point, the remedy consists in making a *stop*, and dividing the series of experiments into two portions. A remarkable instance, of this sort, occurs on March 20, 1841; when, at experiment 282, the time of vibration increased very considerably all at once, whilst during the same period the march of the resting point appears to have been very much disturbed; and this alteration in these important elements continued during the remainder of the day. In the computation of the results, a stop has consequently been made at experiment 281; and the two subsequent experiments in that series have been separated from the preceding ones; and (being a binary connexion) are computed agreeably to Cavendish's method, as already stated in the note in the preceding page, where other similar cases are referred to.

§ 13. *The Torsion Force.*

The torsion force of a wire is that elastic power in the body, by means of which it is enabled to return to its original position, after being drawn aside by any external impulse. The force of torsion is inversely proportional to the squares of the times, and to the length of the wires, and directly proportional to the *fourth* power of the diameters of those wires. The lengths of the wires being equal, the weights of those wires are proportional to the squares of their diameters; and the times of oscillation are reciprocal to those squares. This force, therefore, varies with the substance, magnitude, and length of the wire; but it is generally considered to be constant for the same wire, whatever be the weight suspended thereto. This, however, must be taken within certain limits, since the time of vibration (which is one of the

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elements for determining the force of torsion) will frequently differ very considerably without any apparent or sensible alteration in the component parts of the apparatus. For, although the weight, attached to the wire, may sometimes slightly differ, from one day to another, by the alteration of moisture in the atmosphere, which affects the torsion rod, yet this variation of weight will not sensibly affect the value of the torsion force, during any consecutive set of experiments: whereas, on the other hand, we frequently have, in the *same hour*, very considerable variations in the time of vibration, which evidently shew that the force of torsion has undergone some sensible change.* But, this alteration in the torsion force does not appear to affect the results of the experiments, since we find that, when the time increases, the deviation is also increased in due proportion. The magnitude, therefore, of the force of torsion is not a necessary object of inquiry in these investigations.

What has been here stated respecting the *single* suspension wire, possessed of elasticity, will apply with nearly equal force to the bifilar, or *double* suspension lines, whether formed of silk, or nealed wire: with this exception, that instead of the force being proportional to the fourth power of the diameters of the wires, it will be proportional to the squares of their mean distances apart.

From the results of the several experiments that I have made, it would appear that *single* wires, of different diameters, give slight differences in the results. But, the most discordant results occur where the *double* suspension lines are formed of silk, in the manner already described in page 29. I apprehend that these anomalies have arisen from the circumstance that *all* the fibres, of which the bundle is composed, are not *equally* stretched by the weight of the different balls, as they are successively attached to the torsion rod: and that they are thus severally operated on by different forces, which consequently produces a discordancy in the results.

§ 14. *The Time of Vibration.*

The time of vibration denotes the number of seconds employed by the torsion rod in making one oscillation; and it is, in general, pretty uniform and regular during a series of experiments, more especially if the masses are

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* See a remarkable case of this kind on March 20, 1841, already mentioned in the preceding page; and other instances may be found on inspecting the experiments recorded in Table I.

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not disturbed. But, this depends in a great measure on the torsion force of the suspension lines; it being most irregular when the torsion force is weakest. The required number of seconds employed in a vibration, cannot be correctly determined by noting the time when the torsion rod arrives at the extreme ends of the arc of vibration, on account of the difficulty of ascertaining, with sufficient accuracy, the precise *mean* moment of such positions. For the vibratory motion of the torsion rod is similar to that of any other pendulum, inasmuch as it is most rapid in the middle of its oscillation, and becomes stationary for a short period at the extremities of the arc, where the precise time required (or *mean* moment of repose) is confused and uncertain. It is for this reason, indeed, that we cannot, in any case, determine the precise duration of any oscillation, if we confine our observation to the oscillation itself; nor perhaps with *rigid accuracy* in any case.* But we may readily deduce its approximate value by taking the sum of the halves of two consecutive oscillations, which is easily obtained by the method which I shall now proceed to describe.

The mean resting point of the torsion rod is always sufficiently well known, to enable the experimentalist to select two divisions of the scale not far from such resting point, and so situate that they may be on different sides of that assumed point.† The precise times when these divisions of the scale pass the central line of the telescope, in each vibration, can be observed with as much accuracy, and nearly in the same manner, as the transit of a star.‡ From these recorded times of the transits of the selected divisions of the scale, we may readily compute, by simple proportion, the times of the transits of the resting point in the two consecutive vibrations; and thence the mean duration of one vibration of the torsion rod, which will be very near the truth: and it is with a view to such computations, that the observations are arranged and recorded in Table I. The following example, which is the first experiment there recorded, will explain the method of proceeding, here alluded to. The fourth column of that Table denotes the extreme divisions observed at the beginning and end of three consecutive vibrations; the next three columns denote respectively the first, second, and third means of those observations. The first value in the sixth column is the mean resting point of the first two vibrations; and the second value in the same column is the mean resting point of the last two vibrations; whilst the value in the seventh column is the mean resting point of all the three oscillations. This last mean is that which I have deduced in almost the whole of my experiments: there being very few cases (nine only in number, and those always recorded*) where I have depended on two vibrations only.

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* The arc of vibration seldom proceeds with perfect uniformity, and is so subject to slight variations, that I much doubt whether the *exact* time of a vibration is ever strictly attainable.—See page 50.

† The selection of the distance of the divisions, for the required point, will depend on the velocity of the motion of the torsion rod: but I have never found it requisite to exceed the distance of five divisions. The distance, however, is not a matter of much moment, as the motion of the torsion rod is always exceedingly uniform at that part of its arc. Nor indeed is it strictly requisite that the selected divisions should be on *each* side of the mean resting point, although this has always been attempted: but in a very few cases it has not succeeded. The experiment 256 is a case where it has failed, but where the result is equally correct.

‡ I speak of the division lines *passing* the telescope line, because they *appear* so to do, although they are *both* firmly fixed, and immoveable. It is the reflected image of the division-lines that is seen in the telescope.

By previous observation it was (in the example above quoted, and which I am now about to explain) well known that the resting point would lie between the divisions 111 and 112; and the transits of those divisions of the scale, at each of the three oscillations, were observed at the respective times recorded in the above example. As these are the approximate times of the *middle* of the three oscillations, the difference between the first and last of the values in each column will give the approximate times of *two* oscillations; the half of which is the approximate value of *one* oscillation. Now since the division 111 occupied $15^{m}\ 30^{s}$ in making two oscillations, and the division 112 occupied $15^{m}\ 32^{s}$ in making the same number of oscillations, or $7^{m}\ 45^{s}$ and $7^{m}\ 46^{s}$ in making *one* oscillation, it follows, by proportion, that the resting point, 111·450 divisions, would occupy $7^{m}\ 45^{s}, 45 = 465{\cdot}450$ seconds, which is therefore the required time of vibration in this case. And this is the method that has been uniformly pursued in the course of these experiments.

It will be seen that the middle times of transit (viz. $10^{h}\ 31^{m}\ 0^{s}$ and $10^{h}\ 30^{m}\ 44^{s}$) are not here required in the computation, and therefore might have been neglected; but I have always observed and recorded these middle times of transit, unless I have been prevented by any other more pressing object of investigation: for they sometimes tend to check and rectify any

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* See note in page 45.

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oversight in observing or recording the other transits, and may always be appealed to as sources of verification, in case of any doubt.

From the method here explained, it will be evident that the time of vibration is ascertained in *every* experiment that takes place; that is, in every change in the position of the masses. This is very different from the mode adopted by Cavendish, who was generally contented with determining the time of vibration for the whole series, at the close of the experiments: and, in three of his experiments, has omitted the determination altogether. His very first experiment shews that this method cannot be trusted: and many of the early experiments in this work, where the torsion force was not very great, testify that considerable errors might have occurred, if the habitual mode which I have above alluded to, had not been constantly pursued.*

In making the observations of the time of the transits of the selected divisions of the scale, I have never attempted to note the beats of the clock nearer than the half second, which is sufficiently accurate for all the purposes required; and I have found, from much experience, that it is far better to adopt one uniform plan in all such cases, than to aim at greater minuteness, which sometimes leads to confusion. For although the motion of the torsion rod is occasionally so slow that the transits can very readily be observed to the tenth of a second, yet it frequently happens that, in the same series, the rapidity is so great that the nearest half second is scarcely seized even with considerable attention.

The magnitude of the arc of vibration is very variable. Neither its increase, when the masses are first brought up to their near position, nor its subsequent decrease during the time that they remain in the same position, appears to be subject to any regular law. It seems to be influenced by the resistance of the atmosphere and the direction of the motion of the resting point. Cavendish has justly remarked that when the torsion rod is moving in the same direction as the resting point, the time of vibration, from one extreme point of the arc to the other, is increased, and it is diminished when they are moving in contrary directions. This, however, is subject to considerable diversity. But, in general, if the resting point moves uniformly, the time of moving from one extreme to the middle point of the arc, will

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* As I shall, in a few instances, have occasion to employ Cavendish's method of deducing the time, I would here remark that a more full explanation of that method will be given in the sequel.

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be equal to that of moving from the same middle point to the other extreme: and moreover, the time of two successive vibrations will be very little altered. Consequently, the time of moving from the middle point of one vibration, to the middle point of the next, will be very little altered; and the slight anomalies that occur may be safely disregarded.*

In a continuous series of experiments, where the masses are necessarily and regularly moved from one side of the torsion box to the other, the arc of vibration gradually increases at every such alteration in the position of the masses. This increase, however, has its term of periodicity, depending on the torsion force employed: for, after coming to a maximum, the magnitude of the arc becomes nearly stationary. In some cases, indeed, when the torsion rod has been set off in a very large arc, either by means of the Hook's joint, or any other process, a *diminution* of the arc will continue till it has reached the stationary magnitude just alluded to.† But although the magnitude of the arc sometimes increases very considerably, yet the time of vibration is not materially affected thereby: since the velocity of the motion of the torsion rod increases nearly in proportion to the increase of the arc; so that the time of vibration is nearly constant under all circumstances. There is however some other influence that affects the time of vibration, as I have already mentioned in page 46, the cause of which I have not yet been able to elucidate: but as the results are not affected thereby, it is needless to enlarge further on it in this place.

§ 15. *The Method of deducing the Results.*

The only two objects requiring close attention, for the purpose of obtaining results from any of these experiments, are the determination of the correct position of the extreme points of the torsion rod, and the true time of certain divisions of the scale passing the centre line of the telescope: or, in other words, the *mean resting point* of the torsion rod, and the *time* of its vibration, deduced from those quantities. Now, it fortunately happens that these two objects can, in all cases, be observed with the greatest ease and accuracy, however anomalous they may be; and they are never accompanied with any doubt or difficulty. There is however another subject that is required also to be accurately ascertained in every series; namely, the exact distance of the centre of the masses from the centre of the balls. But, as the formula (to which I shall presently allude) is founded on the assumption that that distance is *constant* in all cases, and as any difference therefrom is, from the construction of the apparatus, generally very small and readily determined, and its influence on the result easily corrected by the help of a small table, I shall not further allude to it in the present view of the subject. These are the only *variable* quantities in any given series; and I shall now proceed to show how they are to be applied in deducing the results.

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* Cavendish has, in page 476 of his paper, investigated this subject mathematically. But I fear that the slight variations, that occur in practice, prevent the application of so rigid a test.

† See a case of this kind on May 14, 1841, where the arc of vibration was purposely increased to upwards of 20 divisions of the scale, by repeatedly bringing up the masses (first on one side, and then on the other) prior to the commencement of the recorded observations. It very soon diminished to the usual maximum of the torsion force employed. Other cases also may be seen, produced by the Hook's joint, on Decem. 14, 16, 22, and 31, 1841.

I have already mentioned, in page 45, that the difference between the two positions of the mean resting point of the torsion rod, in two consecutive positions of the masses, will lead to the *Deviation*, or mean arc as indicated by the divisions of the scale through which the torsion rod has been moved by the alternate influence of the masses: and if the series consisted of *two* experiments only, this must necessarily be the value assumed; the *half* of which would be the value employed in the computations. But, the series, in general, consists of a much greater number, in some cases extending even to as many as 20 experiments; in the course of which, the resting point frequently undergoes a change of position (mostly in one and the same direction) of such a magnitude as to cause a material difference in the results. In order therefore to obtain an accurate determination of the true deviation, at any given epoch, more free from such anomalies, it becomes necessary to combine the experiments by an arrangement or system of *threes*. Thus, the mean of the first and third experiments should be combined with the second; the mean of the second and fourth, with the third; the mean of the third and fifth, with the fourth; and so on successively to the end of the series: and the *half* of each difference must be assumed as the value to be employed in the computation. By this method we may in most cases eliminate the errors or irregularities arising from the alteration of the position of the resting point; and in all cases approach much nearer to the truth.

The same principle will apply to the method of obtaining a more accurate

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determination of the true *time* of vibration, for the given epoch: for, by combining these contemporaneous quantities, in like manner, by *threes*, we in a great measure eliminate also those slight discordances which occasionally occur likewise in this variable quantity.

In Table II at the end of this work, will be found an accurate register of all the three quantities here alluded to, extracted from the daily experiments recorded in Table I; namely, the position of the resting point, the time of vibration, and the distance of the masses: together with the *deduced* values of the same according to the ternary combinations above mentioned.* The first column contains the date of the day of observation. The second refers to the ordinal number of each experiment. The third designates on which side of the torsion box the masses are placed: the sign + denoting the positive side, and the sign − the negative side. The next three columns contain respectively the *observed* mean resting points of the torsion rod, and the time of vibration corresponding to those resting points; together with the distance of the centre of the masses from the centre of the balls, in their positive and negative positions. The next three collateral columns contain respectively the *deduced* deviation and time, by the ternary method above mentioned; together with the mean distance of the centre of the masses from the centre of the balls. The next (and last) two columns are restricted to the computed mean Density of the Earth, deduced in the manner which I am now about to explain. The first of these two last mentioned columns contains the result of each combined experiment, which I call the *single* results; and the last contains the mean result of each day's proceeding, which I call the *daily* results: reserving the term *mean* result to the mean value of all the single results from one and the same series of experiments.

But, before we can proceed to the computation of the mean Density of the Earth, there are other quantities that are requisite to be known, besides the three *variable* quantities above mentioned: but, as these are always *constant* for the same balls, and are determined for each ball by means of the analytical investigation, which is separately discussed and explained in a subsequent part of this work, I shall not here further notice them than by

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* There are a few cases (nine only in number, see the note in page 45), where the series has been necessarily limited to *two* experiments only; to which I shall presently again allude.

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stating that I shall represent the required value of those constant quantities by the letter C; and refer the reader to the formula for its specific value in each case, when required.

Therefore, if we denote the Deviation by the letter D, and the time of vibration, or Number of seconds employed, (corresponding to the mean resting point) by the letter N, the mean Density of the Earth deduced from each combined experiment will be expressed by the simple formula

$$\frac{N^2}{D} \times C.$$

This, however, is on the presumption that the mean distance between the centre of the masses and the centre of the balls is always exactly 11 inches, as assumed in the general formula above alluded to. But, as this seldom happens, and as a slight difference is generally observed, we must correct the above expression by multiplying it by the quantity $\frac{\delta^2}{(11)^2}$, where δ denotes the distance actually observed: and it is in this manner that all the experiments in this work have been reduced.*

I have already stated (page 49) that there are a few cases (nine only in number) where the series has been limited to two experiments only. In such cases, however, the same formula is still applicable, but we must adopt a different mode of obtaining the value of D, which must be deduced from the *second mean* resting points, as already mentioned in the page above alluded to, selecting the *last* mean resting point of the preceding experiment and the *first* mean resting point of the subsequent experiment for the determination of its value: these being the positions which, in point of time, are the nearest to each other, and therefore less likely to have experienced any effective change. With respect to the value of N, it must be deduced by determining, in each experiment, the time actually occupied in making the vibrations of the arc employed in the computation, and then taking the mean of the two. An example, taken from the experiments 109 and 110 in Table I (to which the reader is referred) will best explain the mode of proceeding in these few cases: it being understood that the following statement shows the time at which the assumed fractional divisions of the scale passed the centre wire of the telescope, as deduced by proportion agreeably to the method already alluded to in page 49.

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* The logarithmic value of $\frac{\delta^2}{(11)^2}$, for all the probable values of δ, has been arranged in a convenient Table, as already mentioned in page 52; and will be afterwards given.

Div.		h	m	s	m	s	N
116·850	at	3	48	33,275			
116·100	..	3	56	38,350	8	5,075	
97·550	at	4	5	1,035			
95·200	..	4	13	10,500	8	8,465	
Mean time of vibration =					8	7,270	= 487·270.

The value of N, therefore, for the arc employed, will be 487·270;* and the value of D, as found by an inspection of Table I, equal to $\frac{116{\cdot}475 - 96{\cdot}375}{2}$ = 10·050; which method I consider to be a more correct mode of proceeding in such binary cases, than the adoption of that which is pursued in all the more extensive and ternary experiments.

For the sake of a convenient reference, when this mode of proceeding is alluded to, I shall designate it by the title of CAVENDISH's method: not that it exactly coincides with the plan which he adopted, but it approximates so nearly to it that the difference is probably not readily distinguishable without some explanation. CAVENDISH always took the *second mean* of the extreme points as the true position of the resting point: and always compared his *last* true resting point in one experiment, with the *first* true resting point of the next succeeding experiment, for the purpose of determining the deviation; and thus far our two methods for determining the deviation, in these binary cases, are precisely alike. It is only in the mode of determining the time of vibration that there appears to be any decided difference. For, CAVENDISH always continued the motion of the torsion rod for an indefinite period after the determination of the resting point for the deviation, and deduced the mean time of vibration from observations made at the beginning and end of that period: not perhaps bearing in mind that, during that period, the time of vibration might be (as, indeed, it often is) subject to variation, and might thus affect the results deduced therefrom. Whereas, on the contrary, I have always considered the true time to be that which occurs during the motion of the very vibrations that are employed for determining the resting point; having had frequent experience of sudden changes in the time of vibration, without any apparent cause: which changes, though perhaps not always very great, might sometimes sensibly affect the results, if not carefully attended to.

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* This value is different from the mean of the two values in the last column in Table I: and this is always to be understood when CAVENDISH's method has been resorted to, for the purpose of obtaining specific results, since they are computed in a different manner.

There is one important remark that it may perhaps be necessary here to make, respecting the value of some of the *single* results inserted in Table II. From an inspection of those values it might seem to appear (more especially in those series where the bifilar *silk* lines, or any of the *light* balls, are employed) that discordances and anomalies occasionally take place, of sufficient magnitude to disturb our confidence in the accuracy of the method employed; or at least to throw a degree of doubt on the values of the quantities obtained. But, it should be borne in mind that irregularities must necessarily take place when the resting point changes the direction of its motion (as it often does) during the progress of any series. On the other hand, however, it should be remembered that it also necessarily follows that the effect of such an irregularity is in a great measure, if not wholly, counteracted by irregularities caused by the motion of the resting point in a similar direction on the opposite side, during the subsequent experiments in the same series. Whence it follows that the difference, or apparent discordance, is eliminated by taking the mean of the whole number of experiments that have been made consecutively in any one day: and it is on this account that I consider the accordance of the *daily* results of the whole of any series, to be the best test of the accuracy of the method employed; and as that which should be principally kept in view, and appealed to, when about to form an opinion on this delicate inquiry.

§ 16. *The Mode of conducting the Experiments.*

I have generally pursued a certain degree of uniformity in carrying on the experiments; being convinced that, where a long course of them is about to be undertaken, a method of this kind is the most effectual guard not only against the committal of errors, but also against that distraction from the subject, which sometimes occurs when the body is fatigued by a too close and constant attention. In order, therefore, to explain more clearly the mode that I have adopted with respect to the observations of the torsion rod, which are by far the most important class of the proceedings, I shall begin by supposing the masses to have previously remained in their neutral position till the time of commencing any series. This being the case, the torsion rod is usually found to be in a quiescent state; or, at least, its motion is so slow that the arc of vibration seldom exceeds one or two divisions of the scale: and this motion, although quite sufficient for determining the position of the *resting point*, is evidently too minute for the purpose of determining the *time*. The mean resting point of the torsion rod, when the masses are thus in their neutral position, is called also the neutral position of the torsion rod; and in general, prior to the commencement of any experiments, this position is (by turning the HOOK'S joint) made to approach as nearly as possible to the zero line of the torsion rod, alluded to in page 24; or, in other words, to rest nearly in the centre of the torsion box.

As it is consequently in most cases necessary, first of all, to increase the magnitude of this arc, in order to deduce the *time* of vibration, two methods may be adopted for putting the torsion rod in motion. One is by turning the HOOK'S joint, which not only increases the arc, but also considerably disturbs the neutral position of the torsion rod: the other is by bringing up the masses to their near position, first on one side and then on the other, which merely increases the arc of vibration without materially disturbing the neutral position of the torsion rod. I have generally adopted the latter mode; although I have occasionally used the former, when the balls have been too far from the centre of the torsion box.

But, in whichever way the torsion rod has been first set in motion, the universal mode which I have adopted for conducting the experiments (with the exception of the 23 experiments, forming the 2nd series, which will be alluded to presently) has been as follows. When the torsion rod has arrived at its extreme point, on either side of the torsion box, which may be chosen at pleasure, and which we will suppose to be the negative side, and whilst it is in that momentary state of repose, the experiment is considered as commencing; and at this moment the division of the scale, cut by the central wire in the telescope, must be noted and recorded. The masses are then *immediately* to be brought round *rapidly* to the opposite (or positive) side, and, whilst they are in that position, the next three extreme points, which the torsion rod reaches in the course of its vibrations, must in like manner be observed and recorded: thus making four extreme points in the whole.

When the last (or fourth) of these extreme points has been noted and recorded, the experiment is considered as complete.

But, a second experiment may now be commenced; and therefore whilst the torsion rod is in that state of repose, the masses must be again *rapidly* brought round to the opposite (or negative) side, and the same process repeated by observing three other consecutive extreme points in this new position of the masses; which, with the last extreme point in the preceding experiment, completes here also the four extreme points required. And so on successively for a series of experiments, as long as may be convenient or requisite. A bare inspection of Table I will fully explain this mode of proceeding.

From these four extreme points, the mean resting point of the torsion rod, for the period elapsed, is determined by taking the third mean, as already described in page 44; and the mean duration of a vibration, for the same period, is likewise determined by the method laid down in page 49. I need not therefore here repeat what has there been stated.

In some few cases at the commencement of a series of experiments, I have adopted Cavendish's method of allowing the masses to remain, in a quiescent state, in their *near* position, without disturbing them, and have assumed this resting point as the first of the series. But I do not consider this plan to be so accurate as setting the torsion rod in motion, since it appears that the position of the resting point is generally affected by the motion of the masses: moreover the time of vibration cannot be obtained in such an experiment, on account of the smallness of the arc. I therefore soon discontinued this practice. The experiments 66 and 74, as well as some others in Table I, are instances of this kind.

In conducting experiments in the manner above mentioned, it is well known that the arc of vibration is generally increased every time that the masses are moved; and that, under certain circumstances, the arc may become so large that the balls would strike against the sides of the torsion box, and thus put an end to the series sooner than is desirable; this however depends, in a great measure, upon the torsion force of the suspension lines.*

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* Instances of this occurrence will be found in the 53rd series, where I have never been able to complete more than four experiments in the course of any one day, in consequence of the magnitude of the arc of vibration. In some other cases also, arising from the same cause, I have been obliged to leave off sooner than I intended.

But, in order to prevent the risk of any premature occurrence of this kind, I tried another mode of operation, which I considered, if carefully conducted, would probably tend to keep the arc of vibration within the required limits: but which I continued only for a short time.

In order to explain more clearly this mode of proceeding, I shall assume that the experiment commences when the torsion rod is at its extreme point on the *positive* side, the masses being also on the *same* side. When the torsion rod arrives at its fourth extreme point (negative), the same must be noted and recorded, since it is to be used to complete that vibration. See the experiments 38 to 60, in Table I. Then *immediately*, and before the torsion rod begins to turn, the masses must be brought round *quickly* to the same, or negative side; which will attract the torsion rod still further towards that side. When the torsion rod has become stationary in this advanced position, this second extreme point (still negative) is to be noted and assumed as the first extreme point of the subsequent experiment: and so on, as before, at the end of every third complete vibration. By this method, the time of one vibration is lost; and it is remarkable that the mean arc of vibration of each consecutive experiment is alternately increased and diminished, as the masses are successively moved to their near position. For, it will be found that in a series of any three consecutive experiments, the arcs of the middle experiment are always greater or less than those of either of the other two.

I made only 23 experiments in this way; for although the principle may be correct, yet the difficulty of seizing the precise moment at which the masses ought to be put in motion, occasionally introduced disturbances which affected the accuracy of the results. For instance, if, in watching for the state of repose of the torsion rod, at its fourth extreme point, too great a time be suffered to elapse, and the torsion rod be permitted to commence its return, the bringing up of the masses at that moment will not then counteract the torsion force of the suspension lines: and thus an error will be introduced not only in the position of the resting point, but also in the time of vibration. This, I apprehend, has been the cause of the discordances which occur in these experiments. Probably greater experience might have led to greater confidence and accuracy; but, as other more convenient modes of curtailing the arc of vibration were then suggested, I did not consider the subject worth pursuing further. These 23 experiments are however retained,

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and are the 2nd series, containing the experiments 38 to 60 both inclusive, in the Tables I and II at the end of this work. All other experiments were conducted in the usual manner, as already explained.

This being premised, I shall now proceed to relate the several experiments that I have made since the completion of the new arrangement of the apparatus, alluded to in page 42.

§ 17. *An Account of the several Experiments.*

The new experiments just alluded to, and which have been made since the completion of the final arrangement of the apparatus, already mentioned in page 42, are all recorded in Table I, and the results of them are contained in Table II, at the end of this work. For the sake of uniformity I shall here arrange them in the chronological order in which they were made; and, with a view to a more convenient reference, shall prefix to each paragraph the *number* of the *series* that is the subject of explanation. I would however previously remark, with respect to the first three series, that I began each of them with the 2-inch lead balls, which had been previously gilt and burnished, and which were in each series supported by the bifilar silk lines. I made 134 experiments in this manner before any alteration was made in the mode of suspension: but as 23 of these were conducted according to the new mode just alluded to in the preceding page, and as they were attended with discordances which appear to have vitiated many of the results, I shall divide the whole into 3 distinct and separate portions. This explanation will account for such separation.

1. The first series consists of 37 experiments, made (as already mentioned) with the 2-inch lead balls, and bifilar silk line suspension, the distance being 0·177 inch. The *single* results,* in Table II, are very uniform, with perhaps the exception of those deduced from the experiments made on Jan. 30th, where a slight discordance appears to have been caused by an alteration in the direction of the motion of the resting point, and which commenced at experiment 30. The *daily* results do not materially differ from the mean result of the whole, which is 5·681.

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* I call those results, the *single* results, which are deduced from *each* combination of three experiments; and I designate by the term *daily* results, the mean of *all* the single results in any one day. See page 53. These single and daily results are contained in Table II.

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2. The second consists of the 23 experiments made with the same balls, and the same mode of suspension; but, by bringing up the masses in the manner just mentioned in page 59, instead of the usual mode. In many of these experiments (such as 42, 48, 50, 51, 57, 58, 60) it will be seen, in Table I, that the arc of vibration *in*creases, instead of being diminished; and, in some other cases, it appears that discordances occur in the time of vibration and in the march of the resting point. All which, together with the single and daily results in Table II, shew that there are evident signs of a disturbing force caused by this mode of operating with the masses. On this account it may become a question whether these experiments are entitled to that confidence which the subject requires; although the mean result (= 5·582) is not so discordant as some others.

3. After these experiments I resumed the original mode of putting the masses in motion, and continued the first series by making 74 additional experiments with the same balls and the same mode of suspension. These experiments agree very well, both in the single and in the daily results, with those that are recorded in the first series. The mean result is 5·664.

4. These three series being thus completed, I unscrewed the lead balls, and affixed, in lieu thereof, the 2-inch zinc balls; no other alteration whatever being made in any part of the apparatus: and I made 102 experiments in this manner. It should be remarked that the lead and the zinc were the heaviest and the lightest metals that I could conveniently select, of this size; and were so chosen for the purpose of ascertaining whether the results would be affected by the difference in the density of the balls. The single results however with the zinc balls, although differing somewhat more from each other than those deduced from the lead balls, may be considered as falling within the limits of the differences that usually occur in experiments of this kind. The mean result of the whole is 5·719; which is somewhat greater than that of the lead balls.

5. I then unscrewed the zinc balls, and fastened the 2-inch glass balls to the torsion rod; no other alteration whatever being made in any part of the apparatus. I made 51 experiments therewith; the single results in each day agreeing very well with one another, but the daily results exhibiting differences similar to those in the preceding series. It is remarkable that the time of vibration on March 17th exceeds very considerably the time of vibration before and after that day: and that a similar increase in the time takes place

on the 19th and on the 20th. But, although there is a manifest discordance in the motion of the resting point, and in the time of vibration, yet the single results may still be considered to be within the probable limits of the usual differences. The mean result of the whole is 5·799; which is still greater than that of the zinc balls.

6. The last series of experiments that were now made with the bifilar silk lines, at their present distance apart (= 0·177 inch) were with the 1½-inch platina balls. The glass balls being removed, the platina balls were screwed to the torsion rod, without disturbing any other part of the apparatus. I made 43 experiments with these balls; the single results of which are fairly within the usual limits, and agree very well with the mean result of the whole, which is 5·679.

7. Finding that there was no very considerable difference in the results with these different balls, suspended in the manner here alluded to, I took down the bifilar silk lines, and having fastened the upper part of the same lines to another stem, and having introduced a larger roller at the lower end, the mean distance between the lines was thereby increased to 0·415 inch. See page 29. The 2-inch lead balls were then again attached to the torsion rod; and I made 64 experiments under this new arrangement. The single and daily results are here more accordant than in the first and third series; and the time of vibration is also more uniform than in any of the preceding series. In fact, the experiments themselves agree much better with each other, and evidently shew that there is here a less disturbing force than under the preceding circumstances. The mean result is 5·681, which accords remarkably well with the first experiments with the same balls.

8. Being desirous of trying the effect of a larger and a heavier ball, under this disposition of the suspension lines (for, such a step was not practicable under the preceding arrangement, on account of the magnitude of the arc caused thereby), I took away the torsion rod, and mounted a stronger one (See page 21); to which I affixed the 2½-inch lead balls, which had been gilt and burnished; the bifilar lines remaining the same as in the preceding experiment. I made 54 experiments in this manner; and the results, which are equally accordant amongst themselves with the preceding ones, manifest and warrant an equal degree of confidence. The mean result is 5·635; which is somewhat, but not materially, less than the general result with the 2-inch lead balls.

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9. Having thus ascertained the effect of the bifilar mode of suspension, in the two different ways above mentioned, I next proposed to try the mode of suspension by means of a single copper wire, as adopted by CAVENDISH and REICH. I therefore dismounted the whole of the apparatus, and having restored the former torsion rod, I suspended it by a wire whose diameter was estimated at 0·0178 inch. I then annexed the 2-inch lead balls thereto, and made 54 experiments; the single and daily results of which agree very well with each other. The mean result (= 5·672) is likewise in remarkable accordance with the mean results obtained by the same balls when suspended by the silk lines. As this method was adopted for the sole purpose of satisfying myself as to this point, I did not, at this time, pursue the subject any further: although in the sequel it will be seen that some additional experiments were made not only with this same single wire suspension, but also with one of a thicker kind.

10. I now again reverted to the suspension by bifilar lines; but, instead of using silk, I adopted nealed *metal* wire. For, as the torsion rod, when suspended by silk, is completely insulated, it might possibly happen that, if any electrical influence were in action within the torsion box, some disturbing force might exist that could not be obviated. Two kinds of metal presented themselves, brass and iron; but the former was selected, at first, under the impression that iron might be affected with some magnetic influence. I therefore again dismounted the whole of the apparatus, and having suspended the torsion rod by the bifilar brass wires, the mean distance of which was 0·415 inch, I annexed the 2-inch lead balls thereto, and made 32 experiments. The mean result of these experiments is 5·688; and the single and daily results are in remarkable accordance not only with each other but also with those previously obtained from the same balls differently suspended.

11. I next tried iron wire for the bifilar suspension. It was the finest that I could procure sufficiently strong for the purpose, as mentioned in page 29: its computed diameter was 0·0091 inch. The same torsion rod and the same lead balls remained, and no other alteration was made than the removal of the brass wire, and the substitution of the iron wire: the mean distance between the lines being still 0·415 inch. I made 46 experiments under this arrangement: and I have the satisfaction of again recording the remarkable coincidence between the mean result here deduced (= 5·682), and those obtained by the same balls on former occasions.

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12. Thus seeing that the results came out nearly the same, with the same balls, in whatever way the experiments were varied, I next tried the same plan with the glass balls, the single results of which, with the first bifilar silk suspension, had been somewhat more discordant, and the mean result somewhat greater, than the results obtained by the other balls. I therefore unscrewed the lead balls, and again affixed the 2-inch glass balls to the same torsion rod, without making any other alteration in the disposition of the apparatus. I made 50 experiments in this manner, and must confess that I was agreeably surprised at finding the single and daily results in such good accordance with each other, and more especially that the mean result (= 5·760) agreed so remarkably well with that which had been previously obtained by the same balls: although I was still at a loss to account for the slight difference which still existed between the results with these balls and the heavier ones.

13. Having some reason to suspect that this slight difference just mentioned (although perhaps not greater than might have been anticipated) might be occasioned by the difference in the weight of the materials with which the suspension lines were loaded, I varied this last series of experiments in the following manner. I opened the side of the torsion box, and without disturbing any part of the apparatus, I affixed to the *centre* of the torsion rod two 2-inch copper balls (that had been previously made) the weight of which, together with the weight of the two glass balls, were about equal to the weight of the two 2-inch lead balls used in the former experiments: for, each copper ball weighed 9400 grains. But, although I made 50 experiments in this manner also, the mean result (= 5·744) was nearly identical with that in the preceding series, and all equally accordant.

14. I next tried what the result would be with balls made of a substance still lighter than that of glass. I therefore unscrewed the glass balls and affixed to the torsion rod the 2-inch ivory balls; no other alteration being made except the removal of the two copper balls from the centre of the torsion rod, which had been added in the preceding series. I made 46 experiments with these balls; the single and daily results of which are in very good accordance, and the mean result (= 5·657) agrees very well with the general result of the experiments previously made with the 2-inch lead balls; although it is somewhat less than that deduced from the experiments made with the glass balls, which was contrary to my expectations.

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15. Conceiving that there might be some unexplained cause even for this slight discordance, I resolved to repeat the experiments under the same circumstances. Therefore, after the lapse of a fortnight, every thing having remained in the same condition (without any disturbance), I made 46 additional experiments; and was surprised to find that although the single and daily results were still in good accordance with each other, yet the mean result (= 5·556) was still less than in the former series. I am unable to account for the cause of this discordance in any other way than by the known fact that in all cases, where the deviation is so small as that which takes place when such light bodies are employed, a slight variation in the position of the resting point makes a considerable difference in the resulting density: a circumstance which might perhaps be urged against the use of such light bodies, with such an apparatus, for the determination of so difficult a subject of inquiry. But, in the present instance, the single and daily results are in very good accordance with each other, and the differences, in fact, are not so great as in many of the preceding cases; more especially in those of the first six series. Some other varying force therefore would seem to be in operation.

16. Wishing however to ascertain whether a similar diminished result would be produced by a repetition of the experiments with the glass balls, I again submitted them to another trial. The ivory balls were therefore unscrewed, and the glass balls again attached to the torsion rod, under the same circumstances as before; and 50 experiments were again made in the same manner. The single and daily results were here likewise in very good accordance with each other; and the mean result (= 5·621) shewed that the same diminished difference had here also been produced, as in the recent case of the experiments with the ivory balls; and for the cause of which I cannot account in any other way than that to which I have just alluded.

17. Hitherto the length of the suspension line might be assumed to have been, in all the cases, about 60 inches; but, I was now desirous of ascertaining whether any considerable difference in the results would arise from an alteration of that length. I therefore shortened it one third, or by about 20 inches, in the manner already described in page 28; and having attached the 2-inch lead balls to the torsion rod, suspended by the bifilar iron wires as before, I made 56 experiments. The single and daily results are in very good accordance, and the mean result (= 5·652) agrees very well with the

mean result from the experiments made with the same balls under other circumstances. I did not consider it necessary to repeat this experiment in any other way, as it appeared to me to establish the fact that no very material difference was likely to arise from a mere alteration in the length of the suspension lines. I therefore discontinued this investigation.

18. I now return to the 2½-inch lead balls, on which I had, as yet, made only one series of experiments. I therefore dismounted the whole of the apparatus, substituted the former torsion rod that was used on a similar occasion, and suspended by the bifilar brass wire; the mean distance of the lines being in this case only 0·380 inch. See the note in page 29. I made 50 experiments in this manner; the single and daily results of which are here also in remarkable accordance with each other, but the mean result (= 5·533) is somewhat less than in the 8th series, previously made.

19. Apprehending that this circumstance might arise from some latent principle in the constitution of the metal wire, I removed it, and suspended the torsion rod by the bifilar silk lines; the mean distance between the lines being the same as before. I made 50 experiments also under this arrangement of the apparatus, and found the same remarkable accordance in the single and daily results. The mean result (= 5·500) differed very slightly from that obtained in the preceding series.

I trust I may here be allowed to mention, that it was during the course of this last series of experiments that I met with the dreadful accident (in one of the most public streets of London) that nearly deprived me of existence. I was taken up, insensible and almost lifeless, and immediately carried to the Charing Cross Hospital, at which excellent establishment, although admirably attended, I was, for some time, despaired of, and obliged to remain three weeks before I could be safely removed to my own house; where I, providentially, completely recovered in a remarkably rapid manner.*

I had, previously to this misfortune, made 36 of the experiments above alluded to; 16 of which were completed on the very morning of the accident: and seven weeks elapsed before I could again venture to resume the observations and complete the proposed number of experiments, during which time the apparatus had remained undisturbed. And I may here notice as a singular circumstance and as a satisfactory evidence of the

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* See Mr. Guthrie's recent treatise *On Injuries of the Head, &c.*, in which this case is recorded, together with a description of the system of treatment pursued.

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permanent state of the apparatus and of the accuracy of the steps pursued, that the mean result of the first 36 experiments was 5·503, and that that of the last 14 was 5·501; all the single results, in each portion, being very accordant with each other. I am still however unable to assign any satisfactory reason why the mean result of these heavy balls should be so much less than that of the lighter balls. There is nothing on the face of the experiments that indicates any cause for a suspicion of error; and therefore we must look for some other explanation.

20. On the resumption of the experiments, after my recovery, I was desirous of again trying the single wire suspension. I therefore selected a copper wire somewhat thicker than that which was employed on the former occasion in the 9th series; the computed diameter being 0·0219 inch. The whole of the apparatus was therefore again dismounted; the 1½-inch platina balls were affixed to the other torsion rod, and the whole suspended by the single copper wire above mentioned. I made 46 experiments, the single results (and consequently the daily results) of which are here also in remarkable accordance: the mean result (= 5·564) is somewhat less than the mean result obtained by the same balls, when suspended by the bifilar silk lines, in the 6th series.

21. Desirous of ascertaining the effect of this wire on other balls, I removed the platina balls, and screwed the 2-inch lead balls to the same torsion rod, retaining also the same copper wire suspension. I made 42 experiments in this manner; all of which are equally accordant with each other, as in the preceding series. But here also the mean result (= 5·538) is somewhat less than the general mean result of the experiments with the same balls differently suspended: a circumstance (combined with others that cannot have escaped observation) which would seem to indicate that slight differences in the results may arise from a difference either in the mode of suspension, or in the component parts of which the suspension lines are formed.

22. It having been suggested to me that a difference in the mean results of the experiments, with balls of the same weight, might occur if there was a considerable difference in their magnitudes, I caused two *hollow* brass balls to be made 2½ inches in diameter, and of a weight equal to the 1½-inch platina balls just mentioned. Having therefore unscrewed the platina balls, I affixed these hollow brass balls to the torsion rod; the same single copper

wire suspension being still employed, and every thing else remaining the same. I made 46 experiments also under this arrangement; all of which, as in the preceding cases, are very accordant with each other, and the mean result (= 5·636) differing but slightly from that obtained by the platina balls in the 20th series, yet somewhat greater.

23. Wishing to test the accuracy of this comparison by another and a different process, I dismounted the single wire suspension, and replaced the bifilar silk lines; the mean distance between the lines being 0·367 inch. I first affixed the platina balls to the torsion rod, and made 46 experiments. The single results are here also remarkably accordant: the mean result (= 5·644) is almost identical with that of the same balls suspended by the bifilar silk lines, in the 6th series, but somewhat greater than that obtained by the same balls when suspended by the single copper wire in the 20th series.

24. Immediately afterwards I removed the platina balls, and again screwed on the $2\frac{1}{2}$-inch hollow brass balls; no other alteration whatever being made. Under this arrangement I made also 46 experiments; all of which are here likewise in very remarkable accordance. The mean result (= 5·717) differs slightly from that previously obtained by the same balls suspended by the single copper wire, in the 22nd series; and also from that obtained by the platina balls in the last series. These four cases indicate that the results with the hollow brass balls are slightly greater than those with the platina balls; and also confirm the suspicion that the results with the single copper wire are somewhat less than those with the bifilar suspension.

After the completion of these several experiments, which now amounted to upwards of 1200, made with 7 different balls, varying in magnitude, weight, and substance, and suspended in different ways, I drew up for my own information a synoptical view of the whole, classing them in a variety of forms, in order to see their general bearing and relation to each other, and to discover, if possible, the source of those slight discordances which still existed in some of the mean results. For, although the mean results of each of the several series (with the exception of the 2nd series, which for the present I shall exclude from the consideration) are very satisfactory, and might seem to obviate the necessity of any further inquiry, since the greatest difference does not amount to more than $\frac{1}{40}$ part of the general mean result of the whole, yet as some of the daily results rather exceed this quantity, I

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resolved to repeat a few of the extreme cases; not with an expectation of altering the general mean result at present obtained, but under the hope of being able thereby to trace the cause of those slight differences that occasionally occurred.* And, as the results of the experiments with the thick single copper wire suspension seemed to differ most from those with the bifilar mode of suspension, I re-commenced with that class.

25. I selected the same single copper wire, whose diameter was 0·0219 inch, and having affixed the 2-inch lead balls to the torsion rod, suspended them thereby. I made 46 experiments, the single results of which are very accordant; and the mean result (= 5·515) almost identical with the mean result in the 21st series.

26. I then made, with the same suspension wire, another double series of experiments for the purpose of comparison between the results with the 1½-inch platina balls and the 2½-inch hollow brass balls, all of which are nearly of the same weight, as already mentioned. The lead balls were removed, and the 2½-inch hollow brass balls were screwed to the torsion rod, without any other alteration whatever. I made 46 experiments, the single results of which are very accordant; and the mean result equal to 5·563, which is somewhat less than the result, with the same suspension, in the 22nd series.

27. These hollow brass balls were then taken away and the 1½-inch platina balls screwed on in their stead, without any other alteration whatever. I then made 40 experiments also in this way, the single results of which are likewise very accordant; and the mean result equal to 5·554, which is almost identical with the result recorded in the 20th series.

28. The next and last series with this single copper wire suspension was now made with the 2-inch zinc balls. The hollow brass balls were removed, and the zinc balls screwed to the torsion rod, without any other alteration whatever. I made only 20 experiments with these balls, the single results of which are not very accordant; the mean result is 5·507, which may be considered as the least value that I had then obtained. And it may here be proper to state that the mean result of the first day was 5·610; whilst that on the second day was 5·445. On examining the apparatus, with a view to

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* The *mean* results vary from 5·500 to 5·799; whilst the *daily* results vary from 5·420 to 6·101. CAVENDISH's 23 results varied from 4·88 to 5·85; and REICH's 14 from 5·168 to 5·693.

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discover the cause of this discordance, I found that the suspension wire was very much curved, in consequence of the balls not being sufficiently heavy to keep it straight. I apprehended therefore that, on this account, the torsion rod might be liable to disturbances which I had not contemplated, and I consequently discontinued this series, and abandoned the further use of this wire, for the present.

29. I then reverted again to the bifilar silk lines; the torsion rod was dismounted, for the purpose of re-adjusting the fulcrum, and the mean distance between the lines was now 0·367 inch. I here commenced with the 2-inch zinc balls, and made 40 experiments therewith; the mean result of which (= 5·725) is almost identical with the mean result obtained with these balls in the 4th series. The daily results are also very accordant; but there is nearly the same discrepancy here in the single results, as in the preceding series just alluded to. Perhaps the circumstance, which will be mentioned in the next paragraph, may have contributed in some measure to this discordance: although I much doubt the effect of its influence.

30. The zinc balls were then unscrewed, and the 2-inch glass balls were attached to the torsion rod, without any other alteration whatever in the apparatus. I made 30 experiments with this arrangement; the mean result of which (=5·690) is somewhat less than the mean result obtained with the same balls in the 5th series. The daily results are fairly accordant; but in the single results there is here also considerable irregularity, arising from discordances in the march of the resting point, and in the time of vibration, nearly similar to that which took place in the 5th series, and probably owing to the same cause. I ought not however to conceal that, on proceeding to dismount the torsion rod at the close of the experiments, I found that after I had introduced the torsion rod (with the zinc balls mentioned in the preceding series) and closed up the side, I had inadvertently omitted to replace the piece of plate glass that should have closed up the south end of the torsion box: and consequently *that* end of the torsion box remained open during the whole time that these two series were carried on. It must however be understood that the *outer* glass, attached to the octagonal frame, was closed as usual; so that the motion of the torsion rod could not be affected by any current of air in the room, unless it gained access to the interior of the frame work. From some subsequent experiments, which were made with the glass balls in the 32nd series, for the express purpose of clearing up this difficulty,

I found that similar irregularities, and even to a greater extent, existed when both ends of the torsion box were properly secured in the usual manner: so that the omission of the outer glass could not have been the sole cause of the anomalies here alluded to.

31. The above-mentioned torsion rod being removed, and the other torsion rod being prepared for the 2½-inch lead balls, it was suspended by the same bifilar silk lines, and with the same mean distance (=0·367 inch). I made 44 experiments therewith; all of which, both the single and daily results, are in remarkable accordance with each other, and seem to indicate that it is the lightness of the balls that causes the discrepancies noticed on the recent occasions. The mean result is 5·649; which is somewhat greater than the mean result deduced not only from the experiments in the 19th series, made with the same balls and the same suspension, but also from those in the 18th series, with the bifilar brass wire.

32. This torsion rod being removed, I again replaced the former torsion rod, with the 2-inch glass balls, and the same bifilar silk suspension lines as before, distance = 0·367 inch; in order to see whether discordances, similar to those which took place in experiment 30, would again occur, when the glass window at the end of the torsion box was closed in the usual manner. I made 38 experiments with these balls; the mean result of which (=5·818) is greater than any which I have ever yet experienced. The discordances in the single results are also more remarkable, arising from variations in the position of the resting point and in the time of vibration; more especially on January 16, when I was obliged to make a stop in the reductions: yet the daily results are tolerably accordant with each other.

33. In order to ascertain whether this anomaly arose from the lightness of the balls, I embraced the present opportunity of trying some further experiments with the ivory balls, suspended in the same manner. I therefore removed the glass balls, and screwed the ivory balls to the same torsion rod; no other alteration whatever being made. I made 36 experiments in this manner; and found that the discordances were still more considerable than any which I had ever yet experienced with other balls, not only in the positions of the resting point, but also in the time of vibration. In fact, the experiments made on January 17, are so anomalous, that I have been obliged to divide them into *three* portions. In the first place, I have made

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a stop at experiment 1512;[*] and the two following ones (1513 and 1514), being discordant with those which precede and follow them, are separated therefrom, and reduced according to Cavendish's method. The experiments likewise, made on January 20, exhibit similar irregularities; and I have consequently been obliged here also to make a stop in the series, at experiment 1538. The six remaining experiments however on this day present so many anomalies that the results are not entitled to much credit. For, the arc of vibration, in experiments 1539 and 1543, *in*creased, instead of being diminished; which evidently shewed that some unlooked-for disturbing force was in active operation, which affected with great irregularity both the time of vibration and the march of the resting point. Nevertheless I have deduced the results in the usual manner: and it will be seen that the last of the single results is remarkably discordant. The mean result of the whole series is 6·023; which is still greater than that mentioned in the preceding series.

34. Being desirous of ascertaining whether this anomaly might arise from the nature and quality of the *silk* lines, I removed them and substituted a fine *iron* wire, (the same as in the 11th–17th series); every thing else being retained as in the preceding case just mentioned. I made 34 experiments under these circumstances, the mean result of which (=5·868) does not materially differ from those just made with the bifilar silk suspension. And although the single and daily results are not quite so irregular as those just alluded to, there is sufficient discrepancy to shew that these light balls are not the best adapted for giving uniform results, whether suspended by silk or iron.

35. Anxious to investigate more satisfactorily the cause of these anomalies, I once more removed the bifilar iron wire suspension, and replaced the same bifilar silk lines, as in the 33rd series; the ivory balls still remaining attached to the torsion rod, and the distance of the lines (=0·367 inch) being still the same. I made 23 experiments in this manner; the mean result of which (=5·769) is much nearer to the general mean result of all the preceding experiments. Yet the single results still continued to exhibit anomalies for which I cannot satisfactorily account, except in the manner

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[*] The arc of vibration, in this experiment, *in*creased, instead of being diminished.

already alluded to. The experiments on January 28 assimilate to those made on January 20, inasmuch as there is great irregularity in the time of vibration and in the march of the resting point: and likewise in the circumstance that the arc of vibration, in experiment 1598, *in*creased instead of being diminished, and that the last of the single results is very discordant.

36. I then removed the ivory balls, and again attached the glass balls to the torsion rod in lieu thereof; no other alteration whatever being made in the arrangement or disposition of the apparatus. I made 19 experiments under these circumstances; the mean result of which (=5·841) is almost identical with that deduced from the experiments in the 32nd series: but both of these are greater than the mean result of the 30th series. The single results however exhibit nearly the same irregularities as in the preceding 30th and 32nd series.

37. Not being able by these proceedings to throw any light on the cause of the discrepancies, so frequently met with in these cases, I conceived it might be occasioned by a slight *twisting* of the suspension lines: for, on a close examination of the lines which were now in operation, I observed that they were not exactly in the same vertical plane, there being nearly 30° difference between the upper and lower positions. I therefore dismounted the whole of the apparatus, and having replaced the bifilar iron wire that was last used in the 34th series, and at the same mean distance apart (= 0·367 inch), I again attached the ivory balls to the torsion rod, and made 8 experiments only, in this manner. I had previously ascertained that the *twisting* of the wires was about $\frac{1}{4}$ of a revolution, yet I was desirous of noting what difference would be produced thereby. The mean result was 5·750; and it should be remarked that the time of vibration is, in this case, much greater than in the experiments recorded in the 34th series, which were conducted with the same balls, and with the same mode of suspension.

38. Not being satisfied with these experiments, and wishing to investigate the subject still further, I again dismounted the whole of the apparatus for the purpose of a minute examination of all the parts. But, not being able to detect any derangement, I again remounted the same torsion rod, and the same bifilar iron wire, with this slight alteration that a larger roller was used at the lower end of the suspension line, which made the mean distance between the wires equal to 0·415 inch. I then affixed the 2-inch lead balls to the torsion rod, and noticed that there was still a slight twisting of the lines,

amounting to about $\frac{1}{8}$ of a revolution; but I proceeded to make 8 experiments, under these circumstances. In consequence of a change in the direction of the motion of the resting point, during the experiments, this series is divided into two portions: but the mean result (=5·603) accords very well with the general mean with these balls.

39. I next unscrewed the lead balls, and replaced the ivory balls once more; every thing else remaining precisely the same as in the last series: with this exception, that I designedly twisted the suspension lines about $\frac{3}{4}$ of a revolution, whereby they crossed and touched each other in the centre. I made only 8 experiments in this manner; the mean result of which (= 5·708) is here also in remarkable accordance with the result obtained with the same balls in the 37th series.

40. I then unscrewed the ivory balls, and once more replaced the 2-inch lead balls, every thing else remaining the same as before; even the twisting of the bifilar lines continuing as in the preceding series. In consequence of the great arc of vibration, caused by this arrangement of the apparatus, I could make only three consecutive experiments before the balls struck against the sides of the torsion box; and even these three experiments would occupy full an hour and a half. This being very inconvenient, and undertaken merely from curiosity, I contented myself with these three experiments, the result of which is 5·390: but I cannot place much dependence on this solitary instance.

41. As I was desirous of ascertaining the true cause of the discordances that still existed at every slight change of the apparatus, I resolved on pursuing some further experiments with different balls, where no other alteration whatever (except the change of the balls) should be made in the arrangement or disposition of the apparatus. I therefore took down the bifilar iron wire, and having untwisted the lines, and caused them to hang in their natural position, I ascertained, by a more correct examination, that the *twisting* of the lines (as thus suspended) was about $\frac{1}{8}$ of a revolution. I found it very difficult to get rid of this altogether: for if it was diminished when certain balls were attached to the torsion rod, it would still vary with an alteration in the weight of the other balls. This circumstance was not peculiar to the bifilar iron wires, but was observable also in the bifilar silk lines: nor indeed was the single copper wire wholly free from this anomaly. I therefore replaced this same iron wire, the mean distance being still equal

to 0·415 inch, and screwed the ivory balls once more to the torsion rod: so that every thing was the same as in the 39th series, except as to the twisting of the suspension lines, which in the present case did not exceed $\frac{1}{8}$ of a revolution. I made 20 experiments in this manner, the single and daily results of which are in very good accordance; and the mean result (=5·762) agrees very well with those made in the 39th series, just alluded to, where the wires crossed each other: the only perceptible difference being in the time of vibration.

42. The ivory balls were then removed, and the zinc balls attached to the torsion rod, in lieu thereof: no other alteration whatever being made. I made also 20 experiments in this manner, the single and daily results of which are in remarkable accordance with each other: and the mean result (=5·668) does not materially differ from the preceding experiments.

43. I then took away the zinc balls, and screwed on the glass balls, every other part of the apparatus remaining as before. I made also 20 experiments in this manner; and here likewise the single and daily results will be found in remarkable accordance with each other. The mean result (=5·767) agrees very well with those made with the same mode of suspension in the 12th and 13th series.

These 60 experiments, with the 3 several kinds of balls, differing so materially in weight, and agreeing so well together in their single and daily results, afford satisfactory evidence that, when the same mode of suspension is adopted, the slight differences that arise are principally caused by the difference in the weight of the balls successively attached to the torsion rod. Other causes of difference, however, may be suspected to arise from a variation in the mode of suspension; as I shall now proceed to shew.

44. The iron suspension wire was now removed, and a new bifilar silk line was introduced in its stead; which was attached to the same brass stem and the same roller: so that the distance (= 0·415 inch) was the same as before. No alteration was made in the torsion rod, or in the glass balls, which were still retained, as in the preceding experiments. I made 20 experiments with this arrangement of the apparatus, the single and daily results of which are not quite so accordant as in the last series; but the mean result (= 5·784) does not materially differ therefrom.

45. The glass balls being removed, the ivory balls were again attached to the torsion rod; no other alteration whatever being made in the arrange-

ment or disposition of the apparatus. I made 20 experiments likewise in this manner, the single results of which, on the first day, were very accordant; but, on the second day, there is some disturbance in the motion of the resting point, which obliged me to make a stop, and divide the results into two portions. The mean result, however (= 5·766), does not materially differ from that obtained in the 41st series.

46. I then removed the ivory balls, and screwed on the 2-inch lead balls, no other alteration being made in the arrangement of the apparatus. But, I ought to mention that the additional weight of these balls stretched the silk lines so much that I was obliged to take them down and shorten them about half an inch. After I had remounted the torsion rod, I brought the balls, by means of the Hook's joint, as usual, into the middle of the torsion box, where I left them till the following day. On inspecting their position, the next morning, I was surprised to find that they were close to the sides of the box, and quite stationary, as if they would have proceeded farther, had they not been thus obstructed. I am unable to account for this disturbance, more especially as there had not been any change of temperature in the room during the interval, nor had the *bifilar* suspension lines ever exhibited any tendency to deviate materially from the position in which they had once been placed. However the balls were again brought into their central position, by means of the Hook's joint, and the series was soon afterwards commenced. I then made here also 20 experiments, the single and daily results of which are remarkably accordant: but the mean result (= 5·550) is less than that obtained with the same mode of suspension in the 7th series.

47. These lead balls being removed, I again screwed the zinc balls to the torsion rod, without disturbing any other part of the apparatus. I made 20 experiments also in this manner, the single and daily results of which are here likewise remarkably accordant: but the mean result (= 5·641) is somewhat less than I had anticipated. Is it probable that in the operation of shortening the silk lines I could have produced such an alteration in the arrangement of the fibres as to have caused a perceptible alteration in the results of these last two series?

Having thus made experiments with the iron and the silk *bifilar* mode of suspension, with balls differing materially in weight (but without altering any other part of the apparatus), in order to trace the effects produced thereby, I next resolved to pursue the same plan with respect to the mode of suspension by a *single* copper wire. The wire selected was similar to that which had been used in the 9th series (see page 63), the computed diameter of which was ·0178 inch.

48. I therefore attached the 2-inch lead balls to the same torsion rod, and suspended it by the single copper wire just mentioned. I made 20 experiments in this manner, the single and daily results of which were very accordant, and the mean result (= 5·678) agreeing very well with that obtained in the 9th series, above alluded to.

49. The lead balls were then removed, and the zinc balls screwed on in their stead, no other alteration whatever being made. I made 20 experiments likewise in this manner, the single and daily results of which were as fully accordant as the preceding, and the mean result (= 5·738) agreeing very well with the results obtained in the 4th and 29th series. The wind was very boisterous during the last six of these experiments.

50. I then took away the zinc balls, and once more restored the ivory balls to the torsion rod, no other alteration whatever being made. I made 20 experiments likewise in this manner, the single and daily results of which were here also remarkably accordant, and the mean result (= 5·787) agreeing very well with many of the results obtained with these balls by other means. Although it must be confessed that the results, with these light balls, have not in general been so accordant as those obtained with the heavier ones.

But these 60 experiments, with the 3 several kinds of balls, differing so materially in weight, afford similar evidence to that alluded to in page 75, that when the same mode of suspension is adopted, the slight differences that arise are principally caused by the difference in the weight of the balls attached to the torsion rod.

51. After the preceding experiments, I dismounted the whole of the apparatus, and having removed the torsion rod then in use, I put up the thicker one previously used in the 8th and some other subsequent series, and attached the 2½-inch lead balls thereto. This torsion rod was suspended by a piece of copper wire, rather thicker than the preceding; the computed diameter being ·0219 inch.* I made 30 experiments in this manner, the

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* I, at first, suspended this torsion rod, and the 2½-inch lead balls, by the same wire that had been used in the preceding experiments, and made two experiments (1848 and 1849) therewith. But this being very inconvenient for the object which I had then in view, on account of the time

single and daily results of which were remarkably accordant; but the mean result (= 5·549) is somewhat less than I had anticipated, although it agrees very well with the results obtained with other balls attached to the other torsion rod, suspended with the same wire. See the series 20, 21, 22, 25, 26, 27.

52. I now removed this suspension wire, and substituted the same single copper wire that had been used in the preceding experiments, the computed diameter of which was ·0178 inch; no other alteration whatever being made in the arrangement or disposition of the apparatus. I made 27 experiments in this manner: and here it may be requisite to state that in consequence of the large arc of vibration in these experiments, which caused the balls eventually to strike against the sides of the torsion box, I was never able to make more than 4 experiments in one day, and oftentimes not more than 3. The daily results are nevertheless very accordant, and the mean result (= 5·647), although greater than that obtained in the preceding series, agrees with others obtained in a different manner. The wind was very boisterous here also during the experiments 1889–1892.

53. I had now repeated the whole of the experiments in all the most discordant cases, and some of them three or four times, with the view of discovering the cause of those anomalies which, however trifling in their effect upon the general result, evidently shewed that some disturbing force was in operation that had hitherto escaped detection. The discordances most difficult of solution were those that occurred when the light balls were employed; more especially when the ivory balls were used. Conceiving that this might partly arise from the great weight of the torsion rod, in comparison with that of the ivory balls, I caused a much lighter torsion rod to be made (as already described in the note in page 20), and having attached the ivory balls thereto, I suspended it by the bifilar silk lines, the distance between which was 0·367 inch. I made 20 experiments in this manner, the single results of which exhibited similar discordances to those which I had on former occasions experienced. The mean result however (= 5·626) is much nearer to that which had been previously obtained by the use of the heavier balls.

which the experiments occupied, I abandoned this mode for the present, and substituted the thicker wire mentioned in the text. These two detached experiments however are not rejected, but are subsequently united with those made in the next series.

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54. On taking a review of all the experiments that had been made up to the present time, it appeared that those which exhibited the least discordance, and were consequently the most to be depended upon, were the experiments made with the heavy balls, suspended by bifilar wires, whose distance was as far apart as was consistent with the required accuracy for observing the time and the arc of vibration. I therefore resolved to close the observations with a series of experiments of this kind, with a view to test the accuracy of the method. The whole of the apparatus was consequently again dismounted; the thick torsion rod was again replaced; the 2½-inch lead balls were screwed thereto; and the whole was suspended by the bifilar iron wire, whose distance was 0·415 inch. I made 80 experiments in this manner, the single and daily results of which are in very remarkable agreement with each other: and what is more worthy of notice, in this very accordant series, is that the 12 experiments (1938–1949) which were made on March 26, were carried on during one of those violent gales of wind, that I have already alluded to in page 30; yet these experiments are equally accordant with the rest. The mean result of the whole is 5·669.

I had now made upwards of 2000 experiments, with balls of different weights and sizes, and suspended in a variety of ways: and I had considered the subject as exhausted, as far as the present mode of conducting the experiments was concerned. But it was afterwards suggested by the Astronomer Royal that possibly some additional light might be thrown on the still undetected sources of discordance, by the use of a much heavier torsion rod than either of those which I had hitherto employed. I therefore caused the brass torsion rod, already described in page 23, to be made expressly for this purpose. The weight of this torsion rod is nearly equal to the weight of the two 2-inch lead balls.

55. My first experiments were with the 2-inch lead balls attached to this torsion rod, and suspended by the bifilar iron wires, whose distance apart was 0·415 inch. I made 20 experiments in this manner, the single and daily results of which were very accordant, and the mean result equal to 5·737.

56. I then removed the lead balls from the torsion rod, without any other alteration whatever; and made 20 experiments with the torsion rod alone. The single and daily results were here also very accordant; but the mean result (= 5·993) was much greater than in the preceding series.

57. I now changed the mode of suspension, by causing the bifilar wires to be closer together, the distance being reduced to 0·177 inch: no other part of the apparatus was altered, and the brass rod was still used, as in the preceding experiment, without any ball attached thereto. I made only 8 experiments in this manner, and even these were so discordant, in the march of the resting point, that I was obliged to make a stop, and divide the whole into two separate portions. The mean result is 6·154; but I have not much confidence in it.

58. After this I dismounted the bifilar iron wire, and put up a thicker one, whose computed diameter was equal to 0·0182 inch: see page 29. The distance of the wires was again increased to 0·415 inch; and, having attached the 2½-inch lead balls to the torsion rod, I made 24 experiments in this manner. The single and daily results are in this case, as in the 55th and 56th series, very accordant: the mean result is 5·621.

59. Being desirous of ascertaining whether the alteration in the thickness of the suspending wire caused any difference in the results, I removed the 2½-inch lead balls, and screwed on the 2-inch lead balls in their stead; no other alteration whatever being made. I made only 9 experiments in this manner; but the single and daily results were very accordant, and the mean result (= 5·702) agrees very well with the result obtained by the 55th series, where the same mode of operation was pursued, with the exception of the thickness of the wire.

60. As this suspending wire would be too thick for the next experiments, I dismounted this bifilar iron wire, and put up a finer one, whose computed diameter was equal to 0·0162 inch: see page 29. The distance of these wires was reduced to 0·367 inch: and having attached the 2½-inch lead balls to the torsion rod, I made 20 experiments in this manner. The single and daily results are here also very accordant; and the mean result equal to 5·586.

61. These balls being removed, I screwed on the 2-inch lead balls, without making any other alteration whatever. I then made 20 experiments in this manner, the single and daily results of which are here likewise in remarkable accordance, and the mean result equal to 5·606.

62. The final series was made with the brass rod alone. The lead balls were unscrewed from the torsion rod, and every thing else suffered to remain as in the preceding experiments. I made 28 experiments in this manner;

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and, although the single and daily results are not quite in such perfect agreement as in the two preceding series, yet they are very satisfactory, and do not exhibit any remarkable instance of discordance. The mean result is 5·927. During the whole of the experiments on the last day (May 8) the wind was very high and boisterous.

It will be seen, from these experiments, that although the results with the 2½-inch lead balls are not much affected by this process, the results with the 2-inch lead balls attached to this heavy brass rod are somewhat greater than the results with the same balls when affixed to the wooden torsion rod; and that the results with the brass rod *alone* are still considerably greater than either. I find, by computation, that if the attraction of the masses on the brass torsion rod be diminished $\frac{1}{20}$ of its value, the several results obtained by the employment of this rod, will be nearly equal, and will accord very well with the general mean result of all the preceding experiments obtained by the usual methods with the other rods.

§ 18. *Review of the different Series.*

Having thus given an account of the several experiments, in the order in which they were made, I shall now proceed to take a review of the different series, for the purpose of pointing out such of them as may appear to be less deserving of confidence than the rest, on account of certain discordances which seem to impair their accuracy. I have already noticed that slight differences occasionally arise in the mean results, not only according to the mode in which the torsion rod is suspended, or to the peculiar substance of which the suspension-line is formed, but also depending, in great measure, on the weight of the balls employed, or on some other special circumstance attending the arrangement of the apparatus.

But, it is not to cases of this kind that I am now about to allude: for, if the single and daily results are tolerably accordant, I am not aware that any one class of these different kinds of experiments is to be preferred to another; and I shall at present consider all such experiments as entitled to an equal degree of confidence. In fact, even when this accordance is not quite so rigorous, the results may still be entitled to confidence. For, I have already remarked in page 56, that irregularities must necessarily take place when the resting point changes the direction of its motion, but that the effect of such irregularity on the results, is in a great measure, if not wholly, counteracted

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by a subsequent *return*-motion of the resting point. And, as this alternate variation in the direction of the motion of the resting point (although slow in its operation) is in general constantly going on during a long series of experiments, the regularity of the *single* results will be consequently affected, although the accuracy of the *daily* result may not be materially impaired.

The case, however, is somewhat different with those experiments which, during any given series or course of operations, do not exhibit so regular and uniform a system; but, on the contrary, shew evident signs of some disturbing force that has hitherto escaped detection, affecting not only the march and direction of the resting point, but also the time of vibration, thus impairing the accuracy, or at least the uniformity, of the results.

The most remarkable instance of this kind occurs in the 33rd series, as I have already mentioned in page 71: and it is worthy of notice that in this series there are no less than three experiments (1512, 1539, and 1543) where the arc of vibration *in*creased instead of being diminished; an evidence of some *extra*-disturbing force, which has baffled every effort of mine to unravel. Indeed, one of the results, where this last-mentioned experiment is involved in the computation, makes the density as high as 9·150: but this rapid and enormous increase is partly assisted by a sudden change in the march of the resting point about that time, so that a variety of circumstances have here combined to produce this extraordinary result. And, astounding as this great quantity may appear, it should be noticed that one of the *single* results on the same day is as low as 4·292: so that by this counteraction the *daily* result is not so very materially affected. (See page 56.) I am unable to throw any light on the cause of these and other discrepancies which occurred in this particular series.

A similar instance, although not quite so discordant in magnitude, occurs in the 35th series: which is, in fact, a repetition of the same class of experiments as that just mentioned. We have here also one of the experiments (1598) exhibiting an *in*crease in the arc of vibration, and thus impairing the result in which its computation is involved.* The last result likewise, in this

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* These four experiments, with four other straggling experiments (32, 172, 1359, and 1884) are the whole number of cases where an *increase* in the arc of vibration has been observed. I here except the seven cases in the 2nd series, already mentioned in page 61, which were conducted under special circumstances; and where the *increase* of the arc of vibration was probably caused by the peculiar mode of moving the masses there alluded to.

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series, is of very considerable magnitude, being as high as 7·425; but here also we have a *single* result on the same day as low as 4·113; so that astounding as this quantity also may appear, yet by this counteraction the *daily* result is not sensibly affected. (See page 56.) But anomalous and discordant as these two series appear to be, yet the rejection of them *both* from the mass of experiments, would affect only the third place of decimals in the general mean result.

Other series might be adduced where the discordances between the single and daily results, although not so great as those already mentioned, evidently shew that some slight disturbing force was in operation, which either escaped detection at the time, or against the influence of which it was found impracticable wholly to protect the apparatus. These cases have occurred mostly with the light balls, and when the torsion force (on account of the mode of suspension) has been weak: and their effect has been exhibited by some irregularity in the march of the resting point, or in the time of vibration. But the ill effect of such influence on the results may in general (unless the discordance be very great and irregular) be obviated by suffering these irregularities to counteract each other by the system (adopted in the present work) of combining the experiments into ternary groups, as described in page 52. Should the reader, however, be of opinion that any other mode of operation would be more correct, he has all the requisite data in Table II, for pursuing the computations in his own way.

But, even when discordances of considerable magnitude, of the kind above mentioned, do not occur, we yet find that the mean results of two several days (the mode of operation continuing the same in both cases) sometimes differ from each other by a greater quantity than might have been previously imagined. Thus, the results of April 10 and 14, 1841, although very accordant amongst themselves as to the *single* results on each day, yet differ from each other in their *daily* results by ·184; which is much greater than any of the differences between the single and daily results on either of those days. And on March 17, 1841, there is a remarkable increase in the time of vibration (verified by two successive operations on the same day) differing from that of any preceding or subsequent day in the same series; which has however produced a corresponding increase in the deviation, and also a slight increase in the mean results on that day. (See page 61.) Similar remarks may be made as to results on several other days: which

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renders it manifest that we cannot always expect rigorous accuracy and uniformity in such delicate investigations, under all the various conflicting circumstances that occur in carrying on the operations. In fact I have frequently experienced instances of this kind, in a variety of other minute experimental researches in which I have been occasionally engaged, where the results have sometimes taken a *start*, which, although not very considerable, has been wholly unaccountable.

The best mode of judging of the accuracy of the mean result of any one series is to compute its *probable error*, which will at the same time shew us whether any considerable discrepancy has taken place between the *single* and *daily* results, and how far the *mean* result is affected thereby. In order to determine the probable error (E) of the mean result of a series of experiments, let n denote the number of single results, and $\Sigma\epsilon^2$ the sum of the squares of the errors: we shall then have,*

$$\text{Probable error, } E = \frac{\sqrt{\Sigma\epsilon^2}}{n} \times \cdot 674489$$

The shortest arithmetical mode of computing the value of $\Sigma\epsilon^2$, in these cases, is as follows: Strike off 5 from the units' place in all the single results, and also in the mean result, which thus leaves, with very few exceptions, only decimal portions to be dealt with; and (by Barlow's *New Mathematical Tables*) find the squares of such decimal portions.† Then the expression for $\Sigma\epsilon^2$, which for the sake of convenience I shall here denote by S, will be

$$S = \text{sum of the squares of } \textit{these} \text{ single results} - \text{square of } \textit{this} \text{ mean result} \times n$$

whence the formula now becomes

$$\text{Probable error, } E = \frac{\sqrt{S}}{n} \times \cdot 674489$$

By means of this formula I have computed the probable error (E) of the mean result of every series; and, in Table II, have annexed the value of the same to each case. The probable error of the mean result of *all* the experiments, of every description, has been deduced, by means of the same formula, by making S, as before, equal to the sum of the squares of *all* the

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* See Galloway's *Treatise on Probability*, page 195.

† In some few instances the result is more than 6, and in others less than 5; but in either case we must take the square of the residual quantity, whatever it may be, which in the latter case will always be *negative*. Thus suppose the results to be 6·3577 and 4·2916, the residual quantities will be 1·3577 and — ·7084; the squares of which are 1·8433 and ·5018, both *positive*.

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single results, *minus* the square of the general mean result of the whole multiplied by the number of single results. This value will be found inserted in Table VII.

§ 19. *Classification of the Results.*

All the experiments, alluded to in the preceding pages, have been made at various times, with various substances, and in various ways, without regard to any other special order or plan than such as has been already related, and which has progressively arisen from the circumstances of the case: and the results of those experiments are recorded in the same chronological manner in Table II; which, being deduced from Table I, contains also the result of *every* experiment that has been made. But, as a more methodical arrangement of these results might tend to place the subject in a more familiar and intelligible point of view, I shall now proceed to state the several classifications that I have made for this purpose, and which are exhibited in Tables at the end of this work, somewhat differently arranged from each other, but still comprising the same mean results.

In Table III, at the end of this work, I have inserted all the several *daily* results (taken from Table II), arranged in the manner which I am now about to relate, but without any other regard to the chronological order in which the experiments have been made, than affixing the number of the series (to which they respectively relate) at the head of each collected group; whereby a reference to the original authority may be at once obtained, if required. The leading division of the subject, which is at the head of the table, refers to the mode of suspension: the experiments with the *bifilar* silk lines (which are placed first) are separated from those with the bifilar wires of brass and iron; and each of these from the experiments with the *single* copper wires, which close this arrangement. The former (that is, the bifilar suspension experiments) are then subdivided according to the mean *distance* between the lines; and the latter (that is, the single wire suspension experiments) according to the *diameter* of the copper wire employed. Under each of these subdivisions, there is a still further subdivision; since the results from the different *balls* are, in all cases, kept distinct from each other, and follow each other in the order of their weights. The number of experiments, from which these several daily results have been deduced, is inserted in the collateral column on the left-hand side of the several results: but, it must be

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borne in mind that this does not strictly express the precise number of *single* results computed therefrom, which (from the mode of proceeding, already explained in page 52) must always be less by 2 than the number of experiments here recorded; except in the 9 cases, mentioned in page 45, where two experiments only have been made. This table indicates the number of experiments, that have been made with the several balls, under each of the several classified modes of suspension, and will shew how often the same class has been repeated: thus, in the 8th column, marked " 2-inch Glass," it will be seen that three distinct series (30, 32, and 36) have been made with these balls, suspended by the bifilar silk lines, whose distance apart was ·367 inch. In some instances I have prefixed a slight notice relative to the particular series, such as whether the suspension lines were shortened, or twisted, the torsion rod loaded, or changed for a lighter one, &c. But, a bare inspection of the table and its several columns will shew the meaning and utility of this mode of identification and classification.

It will be seen that in this table, and in all the subsequent tables (at the end of this work), I have confined the results to *three* places of decimals only: for, although, in the preceding table, I have retained four places of decimals in deducing the results from the observations, yet it has been chiefly for the purpose of obtaining the third place of decimals always correctly determined.

Table IV contains only the *mean* results that are in the preceding table, and arranged nearly on the same plan, according to the mode of suspension, but in a more compact and condensed form; inasmuch as all the experiments of each class, separately exhibited in the preceding table, are here brought together in one mean result:* so that the subject is more immediately and concisely exhibited under one view. After the preceding remarks, this table requires no further explanation.

Table V contains likewise the same *mean* results; but the arrangement is here very different, being made according to the weight of the balls employed in the respective experiments. The heaviest balls are placed the first in order, and the rest follow according to their weight. The results, by the different modes of suspension, are here also kept distinct from each other.

Table VI contains likewise precisely the same *mean* results as the two

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* The result of the experiments in the 2nd series is an exception; as that result is here, and in the two following tables, kept distinct, and is always marked with an asterisk.

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preceding tables; but the arrangement here is made according to the magnitude of the result obtained from each class; whereby we may at once see what connexion there is between the magnitude of the results, and the special nature of the experiments from which they are deduced. If we exclude the experiments that were made with the brass torsion rod *alone,* the mean results here given will be within the limits of 5·49 and 5·87: and these *limits* will not be affected by the retention or exclusion of the experiments recorded in the 2nd series, nor of those made with the ivory balls in series 33 and 35. As to the question, whether or not these doubtful cases should eventually be rejected, I am not prepared to offer any further remarks than those already made in the preceding part of this work, and I shall therefore leave it to the reader to pursue his own plan in this respect. I shall here merely state that the general mean result, which is given at the bottom of this table, has been deduced from *all* the experiments that have been made, without the rejection of a single observation.

But, that I may not wholly leave the subject in this apparent state of uncertainty and indecision, I have subjoined Table VII, by which the reader may at once see how far the *final* result of the experiments, or, in other words,

the mean Density of the Earth,

thus deduced from *all* the experiments here made, is affected by the partial or combined *rejection* of the different experiments, which have just been alluded to, as least worthy of confidence. We shall there find that a difference of only ·001 will be caused by the rejection of the 2nd series; that a difference of only ·008 will be caused by the rejection of the 56 experiments with the brass rod *alone;* that a difference of only ·006 will be caused by the rejection of the 59 experiments made with the ivory balls, in series 33 and 35; and that, if *all* these doubtful experiments be rejected, the general mean result will not be affected more than ·014 by their exclusion. So that the great mass of accordant experiments are not very materially affected by the occurrence of those of a doubtful character, which at first might seem to impair their accuracy and value:

> . . . . *Sed illos*
> *Defendit numerus, junctæque umbone phalanges.*

And with this representation and explanation I shall close my review of this portion of the subject.

§ 20. *On the Experiments made by Mr. Cavendish.*

The experiments made by the late Mr. Cavendish for determining the mean density of the earth, recorded in the *Phil. Trans.* for 1798, have justly obtained considerable celebrity and confidence, not only as being the first and, till within these few years, the only attempt at the solution of this difficult problem by means of the torsion rod, but also from the care and attention with which the experiments have been conducted, as well as from the well-known talents and abilities of the author. It is however notorious that, notwithstanding all his precautions, he still met with certain anomalies for which he could not satisfactorily account, and which, even in his own opinion, threw a degree of doubt on the rigorous accuracy of the result deduced by him. And it is much to be regretted that this able experimentalist did not afterwards pursue the inquiry in the manner which it appears that he at one time proposed, and which would probably have prevented the necessity of any further investigation of the subject.

I have already remarked, in page 8, that Cavendish's object, in drawing up his Memoir, appears to have been more for the purpose of exhibiting a *specimen* of what he considered to be an excellent method of determining this important inquiry, than of deducing a result that should lay claim to the full confidence of the scientific world. And it must be confessed that, if the result was intended to set the question at rest, it would have been more satisfactory had a closer attention been paid to those parts of the observations where great accuracy is specially required, and where considerable variation occasionally takes place.

The principal omission of this kind appears to be in his mode of deducing the *time*, which in no instance has been determined with due accuracy for the whole of the experiment, and which even in six of the cases has not been observed at all, but merely assumed to be the same as the mean of some of the other experiments.* Cavendish appears to have been of opinion that the time of vibration would be nearly constant under all similar circumstances: or, at least, that the differences, which might at any time arise, could not be of any great importance. But, I have already shewn, that very considerable variations oftentimes take place, not only from day to day (see page 61), but also during the course of a single set of experiments (see page 46), and that constant attention should be paid to this important element. In fact the circumstance occurred very early to CAVENDISH himself: for in the third case, in what he calls his first experiment, and also in the third case in his second experiment, the time of vibration is very discordant.

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* In page 50, these appear to be alluded to as *three* cases only: but it should be borne in mind that each of the 3 experiments there mentioned contains two cases.

His experiments also have not been so conducted as to eliminate another source of error arising from the march of the resting point, by arranging them in *groups*, either according to REICH's plan, or the mode adopted in the present work (see page 52); but in every case they have consisted merely of the two experiments that are requisite for deducing the results. So that no means are allowed for correcting the error that would necessarily arise, if (as is usually the case) the resting point is in a progressive and alternate state of motion during the experiment.* In fact, the second case, in what CAVENDISH calls his second experiment, exhibits an *in*crease in the arc of vibration.

Moreover, the *distance* between the centre of the masses and the centre of the balls has been assumed to be a constant quantity (=8·85 inches), throughout the whole of the experiments: but no statement is given of the mode by which this has been determined, nor is the *diameter* of the masses (which is a necessary element in such a measurement) alluded to.† And although great dependance may be placed on CAVENDISH's acknowledged accuracy and skill in his determination of this distance, at the commencement of his experiments, yet it would have been more satisfactory to have known that no alteration in that distance was perceptible during the whole of the series; more especially as some of those experiments were separated from each other by an interval of 8 or 9 months, during which time the position of parts of the apparatus may have been disturbed by various causes.

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* There appears to be some ambiguity, and perhaps an absurdity, in alluding to the *motion* of a point of *rest*. Similar dubious expressions however occur in other branches of science: thus, we speak of the *motion* of the *fixed* stars, the *variation* of *constants*, &c. &c.

† CAVENDISH states that "each of the masses weighs 2439000 grains, and therefore is "equal to 10·64 spherical feet of water." This appears to have been computed from the assumption that a cubic inch of water weighs 253·354 grains, instead of 252·458 grains as more recently determined. But, however this may be, we are not informed whether the weighing took place before, or after, the holes were bored through them, for the introduction of the copper rods. So that the diameter cannot even be *computed* from the elements thus given.

But I shall not pursue this ungracious and ungrateful task any further. It will be sufficient to have pointed out the sources from which any error or anomaly in his experiments may be suspected to have arisen; and I shall now proceed at once to give a summary of the 29 experiments made by Cavendish, together with their corresponding results.* The time ($=$N) and the deviation ($=$B), as quoted in the annexed table, are the values corrected by Cavendish himself, agreeably to the mode which he has pointed out in the Memoir above mentioned: and the Density is deduced by the formula, which he has given, and which is as follows,

$$D = \frac{N^2}{10844\,B}$$

The mean result here given ($= 5{\cdot}448$) slightly differs from that which has been stated by Cavendish, who makes the result equal to 5·48: but Cavendish's arithmetical determination of the general mean is erroneous, and has arisen from a singular mistake which he has *twice* made in this very table. For in deducing the mean result from the first six experiments, he has considered the density, arising from the third experiment, to be 5·88 instead of 4·88: and, in deducing the mean result of the whole number of experiments, he has *again* committed the same error; an arithmetical and venial mistake which might easily have been made by adding up only the decimal parts of the values, and considering *all* the integers as uniform and similar quantities: an error however which is readily detected by the smallest attention. But, as to the accuracy of the calculation of the several results given in the last column, I would remark that I have recomputed the whole of them from the several experiments, by means of the formula and the data given by Cavendish, and find them *all* to be rigorously correct: a circumstance to which I shall soon again have occasion to refer, when I come (in the next section) to Dr. Hutton's unfounded charge of inaccuracy in this respect.

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* I must here again remind the reader that Cavendish enumerates only 17 experiments: but 10 of these contained 2 cases, and 1 of them 3 cases, which are separately and distinctly treated by him in the computations of the results: thus making the 29 experiments alluded to in the text.

No.	N = Time.	B = Deviation.	Density.
1	895	6·710	5·50
2	895	6·585	5·61
3	895	7·345	4·88
4	882	7·070	5·07
5	879	6·780	5·26
6	894	6·640	5·55
7	414	2·950	5·36
8	421	3·090	5·29
9	423	2·960	5·58
10	425	2·950	5·65
11	425	2·990	5·57
12	417	2·900	5·53
13	417	2·855	5·62
14	417	3·030	5·29
15	417	2·950	5·44
16	417	3·000	5·34
17	417	2·770	5·79
18	418	3·160	5·10
19	419	3·075	5·27
20	421	3·035	5·39
21	423	3·045	5·42
22	426	3·060	5·47
23	427	2·985	5·63
24	426	3·135	5·34
25	426	3·065	5·46
26	427	3·170	5·30
27	436	3·050	5·75
28	422	2·890	5·68
29	423	2·820	5·85
		Mean =	5·448

Probable error = ·033

§ 21. *On Dr. Hutton's Review of Cavendish's Experiments.*

In the *Phil. Trans.* for 1821 is inserted a Memoir by Dr. Charles Hutton "On the mean Density of the Earth," which contains some unmerited reflections on the result of Cavendish's labours: and at the end of that paper the author has inserted what he has been pleased to designate as a "copious "list of errata, some of which are large or important." But I trust that I shall succeed in shewing that the major part of these errors, and in fact *all* the "large or important" ones, are of Hutton's own making; and have arisen from his not having fully understood Cavendish's mode of proceeding.

Hutton commences his paper by drawing a comparison between the Schehallien experiment, and that pursued by Cavendish: indeed the principal object, which he appears to have had in view, is to bring forward, in a more prominent manner, the part which he himself took in deducing the results from the Schehallien experiment, and thus to place on record his opinion as to its decided preference; being impressed with the idea that the share which he took in the proceedings had not been duly estimated, and that the results did not obtain the full confidence of the public.* But he shall speak for himself.

"By some strange mistake, or perversion, for many years, it was customary among certain persons, to withhold the mention of my name, with "regard to the great share that I had in the experiment on Schehallien. But "from certain complaints which I have made, some little justice has lately "been awarded to me on that head; though still, it would seem, with reluctance, as the opinion is promptly assumed that the latter small experiment "is susceptible of the greater accuracy, and the numbers in its result gratuitously adopted as nearer the truth than that of the former. As this is "an opinion which I have never been able to bring my mind to acknowledge,

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* This is more distinctly stated by Hutton in a letter which he addressed, in the preceding year, to the Editor of Tilloch's *Philosophical Magazine*, and inserted in the number of that work for February 1820, Vol. lv. page 81. That letter contains a copy of his letter to La Place relative to the Schehallien experiment, and complains of a mistake made by La Place, in the *Con. des Tems* for 1821, page 330, line 2, in attributing the labours of that experiment to Maskelyne, and not to himself. Another letter on the same subject is also inserted in the same work, in the number for November 1820: both of which exhibit his great sensitiveness on this point. All these papers were published long before his Memoir was read at the Royal Society.

"and as it is a matter of great importance in the present state of physics, I "have been desirous to draw the attention of philosophers to a closer consideration of the subject, with a view to a more deliberate and impartial "decision of this point. From the closest and most scrupulous attention I "can employ on this question, the preference, in point of accuracy, appears "to be decidedly in favour of the large or mountain experiment, over that of "the small balls."

HUTTON then, after some remarks on the comparative advantages of the two methods, proceeds to shew the steps which he pursued in deducing the result which he obtained from the Schehallien experiment. But, as I have already alluded to this portion of the subject in the preceding part of this work (see pages 2, &c.), it is unnecessary to enlarge further on it in this place; and I shall at once enter on his reflections upon CAVENDISH's method. His words are as follow.

"Having thus failed in our endeavour to discover any error, or even "suspicion of error, in the conduct or result of the Schehallien experiment, "let us now turn our attention to the other experiment, as performed by "Mr. CAVENDISH. And here I must at once disclaim all expectation of "meeting any failing with regard to the operator himself, whom I well knew "to be a most excellent philosopher and mathematician, as well as a patient, "accurate, and acute experimenter. The failure then, if any, must be expected from the nature of the machine, and of the calculations.

"From the perusal of Mr. CAVENDISH's account of the machine he employed (in the *Philosophical Transactions* of 1798, or vol. xiv. of my "edition), and the nature of the arithmetical calculations, they at once "appear to be formidable and discouraging in the highest degree. The "machine is small, comparatively with those in the former, or mountain "experiment. It is not easily to be understood, without actually seeing it, "though assisted with the view of the drawing of the whole, on account of "the intricacy and perplexity of the construction. In the first place, at each "end of a light wooden rod, of near two yards in length, is attached a small "leaden ball of two inches diameter; the middle of the rod being fixed to "and suspended by a long and very slender copper wire; by any small "movement of these balls and the connecting rod, in a horizontal direction, by "the torsion or twisting of the wire, a very minute and slow vibratory motion "is commenced. To produce this small motion in the two little balls, and

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"their connecting rod, two other large balls of *ten* inches diameter,* are "connected together by certain machinery, at like distance as the former, "and capable of being moved to different distances on the horizontal level "with the small balls. By so setting the large balls near the small ones, "these are attracted by the former, producing a very small motion in them, "and in consequence a very slow vibration. So minute are these motions, "that the extent of the vibrations is but a small fraction of an inch, and the "duration of each vibration is not performed but in the time of several "minutes, from *three* or *four* to near fifteen minutes.† So minute are these "motions, that telescopes and other means are necessary to view and to "estimate their quantity and durations. To produce these minute motions, "very complex machinery are necessarily employed, while the delicate move-"ments are watched for many hours together, during many days, and re-"corded with regard to the extent and time of each vibration. Then, from "these spaces and times, the density of the earth is to be calculated, by "peculiar theorems, as compared with the vibrations of common pendulums "that are produced by the attractions of the earth.

"All these effects were so minute, and produced by machinery so com-"plex, and the results calculated by theorems derived from intricate mathe-"matical investigations, that it is impossible, at first, for ordinary readers to "conceive how any accurate results can be deduced from them; and even "for the more judicious reader to place confidence in them, except chiefly "on account of the high character of the experimenter himself. From the "nature of the machinery, I could therefore derive no confidence in the "results, nor compare them with the mountain experiment, without repeat-"ing the whole of the calculations. But, after a long life spent in almost "daily abstruse investigations, from the tenth year of my age, and now being "at eighty-four, and oppressed with distressing illness, I thought I might be "excused from such a task. But, after urging more than one mathematical "friend, without being able to interest them sufficiently to engage in so "severe an operation, my anxiety to accomplish the business induced me to "make an exertion to effect it myself; especially as the learned experi-"menter informs us, that he availed himself of the assistance of the then

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* The large balls were *twelve* inches in diameter.—F. B.

† None of the vibrations were less than *seven* minutes.—F. B.

" clerk of the Society, who he says made some of the experiments, and who " doubtless made most of the arithmetical computations: operations, of both " kinds, in which I remember he was much employed by Sir Charles " Blagden, and other gentlemen, in preparing their papers for the Royal " Society. I have therefore recomputed all the experiments, and have traced " the investigations of all the theorems; and have found that my labour has " not been in vain; but, on the contrary, has been rewarded with the fol- " lowing copious list of errata, some of which are large or important."

The reader will form his own opinion upon these remarks: but those who have gone through the laborious and voluminous investigations and computations of Hutton himself relative to the Schehallien experiment, inserted in the *Phil. Trans.* for 1778, may perhaps be somewhat surprised at finding the learned Professor of Mathematics designating the arithmetical calculations requisite in Cavendish's experiments " to be formidable and dis- " couraging in the highest degree." But, Hutton was evidently desirous of advancing the merits of the Schehallien experiment as well as the share which he took in the reductions, and in so doing he has endeavoured to throw into the shade the labours of Cavendish, which appeared to eclipse it; but, in his too zealous pursuit, he has fallen into some singular errors which have defeated his object in this respect, as I shall now proceed to shew. And probably the best mode of doing this will be, at once, to point out the source of the mistakes which Hutton himself has committed, and which has enabled him to fill such a " copious list of errata." Thus,

Cavendish, in his paper in the *Phil. Trans.* page 519, says, " The motion " of the ball answering to one division of the arm $= \frac{36,55}{20 \times 38,3}$; and if m B " is the motion of the ball answering to d divisions on the arm, " $\frac{\text{M B}}{\text{W M}} = \frac{36,55\,d}{20 \times 38,3 \times 8,85} = \frac{d}{185}$." Now it is very evident, by referring to page 509 in the same paper, that 36,55 is a misprint and should be 36,65; and, this error being corrected, the result still remains $\frac{d}{185}$, as it there correctly stands. But Hutton, not having discovered this typographical error, has made the result equal to $\frac{d}{186,5}$, and consequently erroneously altered all Cavendish's computations wherein that quantity was concerned.

Again, Hutton has mistaken the rule laid down by Cavendish, in the same page (519), for correcting the motion of the arm. He has assumed the difference of the *motion* of the arm from the division 20, instead of the difference of the *position* of the arm from that division; which affects the amount of the deviation, and consequently the results, wherever that formula occurs.

Moreover, Hutton closes his list of errata by stating that Cavendish computed the mean density of the Earth (D) by the following theorem, viz. $D = \frac{N^2}{10683\ B}$: but Cavendish expressly states, in page 517 of his paper, that when the proper corrections are made, the formula becomes $D = \frac{N^2}{10844\ B}$, which is of course substituted and adopted by Cavendish instead of the preceding one, as may indeed be verified by trial. See page 90 of the present work.

But, after all, what is the real amount of the difference in the general result, even by this erroneous view which Hutton has taken of the method of conducting the computations? He makes the mean result of the 29 experiments equal to 5·420: but he has himself made an error in the 27th experiment, in having considered the time as 422 seconds instead of 436 seconds; the correction of which would make the result of that experiment equal to 5·75 instead of 5·38. So that the *true* mean result of Hutton's computations should be 5·433; differing only ·015 from the mean result deduced from Cavendish's own calculations. Surely, even if Hutton were correct in his charges against Cavendish, (which, however, is by no means the case), this trifling difference would scarcely warrant its being wholly "ascribed to the inaccuracy of making and reading off experiments, with "such intricate and inadequate machinery:" nor indeed is it equal in magnitude to the discordances which occur in the Schehallien experiment, from the different assumptions of the density or position of the strata of the mountain. (See page 5.) But I trust that I have said quite enough to shew that the labours of Cavendish are not in the smallest degree affected by these hypercritical remarks of Dr. Hutton.

§ 22. *On the Experiments made by M. Reich.*

I have already alluded, in pages 9 and 37, to the experiments made by Professor Reich, and to the mode in which they were conducted. He had two masses, but only *one* of them was employed, at one and the same time. The torsion rod and mode of suspension were similar to those of Cavendish. His method of deducing the time of vibration, and the mean resting point were precisely the same as those which I have adopted in the present work; with this slight occasional exception, that he has sometimes (mostly at the commencement of a series) taken 6 or 8 vibrations consecutively; whereas I have never exceeded 4 vibrations. But his mode of grouping the experiments, and deducing the results therefrom, is so far different from mine, inasmuch as he combines the *whole* of the experiments made in any one day, and obtains only *one* result therefrom: whereas I have, in the present work, grouped the experiments in *threes*, with the view of eliminating the errors which might occasionally arise from an alteration in the march of the resting point during the series. (See page 52.) The distance between the centre of the mass and the centre of the ball he has determined at each series.

The whole of these experiments appear to have been made with great care and attention, and the motion of the torsion rod appears also to have been very regular and uniform: consequently there is no great discrepancy in the results, as may be seen by the following table, which is copied from Reich's work. The total number of experiments is **57**, which, owing to his mode of grouping them, produce only **14** results, as follow:

	N = Time.	B = Deviation.	E = Distance.	Density.	No. of Exp.
1	404·717	7·1562	170·155	5·5967	5
2	403·324	6·9375	173·185	5·5346	3
3	403·001	6·2250	180·128	5·6926	4
4	409·366	6·9563	178·965	5·3249	4
5	409·331	6·8500	177·520	5·4950	5
6	408·911	7·7412	168·585	5·3804	3
7	409·287	7·4740	172·048	5·3605	4
8	409·596	7·7375	167·827	5·4506	2
9	407·696	7·6375	168·073	5·4542	6
10	407·195	6·0656	190·120	5·3540	4
11	408·680	6·0625	187·449	5·5507	4
12	408·374	6·3666	189·422	5·1683	6
13	408·667	6·1584	188·572	5·3991	3
14	408·418	6·2417	186·260	5·4534	4
			Mean =	5·4439	57

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The density is determined by the following formula: viz. $D = \frac{N^2}{E^2 B} \times 7{\cdot}079499$; the constant numerical value, 7·079499, being deduced by Reich from certain analytical investigations which he has fully explained in his treatise. The value of N is expressed in seconds of time; B and E are expressed in millimetres.

Reich remarks, that if a value be given to each result, proportionate to the number of experiments employed, the mean result will be 5·4383, with a probable error of 0·0233. This I have examined and verified.

He afterwards made 6 more experiments with another mass made of iron; the result of which was 5·4522.

The reader will at once see that these results, although very accordant in themselves, are somewhat different from those which are recorded in this work, inasmuch as the mean Density of the Earth is, in general, less by Reich's experiments than that obtained by the greater portion of the results deduced from my experiments. But I am, at present, unable to trace the source of the anomaly, unless indeed it may have arisen from some peculiar quality in the wire which he employed for the suspension; since it evidently appears, from some of the experiments recorded in this work, that slight differences occasionally arise not only from this cause, but also from varying the mode of suspension; as may be seen by the classification of the experiments, in Table III, made with several balls suspended in different modes and by different substances. See however page 37, where allusion is made to other sources of discordance.

I have reserved for this, the last, portion of the work an explanation of the method that I have pursued in determining the numerical value of the *Constant*, referred to in page 53. As this quantity is necessarily involved in every result that has been obtained, and as the elements, of which it is formed, vary in almost every case, it is requisite that the numerical values of the several component parts should in each case be distinctly and clearly stated, not only for the satisfaction of those who may be desirous of examining the accuracy of the steps pursued, but also as affording a ready means of detecting the source of any error that may accidentally have been committed.

I am indebted, for the analytical formulæ that have been employed in this inquiry, to the kindness of the Astronomer Royal, who has on this, as on every other occasion when appealed to, assisted me with his advice and counsel, and has throughout taken a lively interest in the progress and prosecution of these experiments. As I cannot add to the lucid exposition which he has given of the principles on which the formulæ are founded, and from which the Constants have been derived, I shall here insert this valuable communication in the precise words of the author.

§ 23. *Mr. Airy on the Mathematical Theory of Cavendish's Experiment.*

The theory, by means of which the Mean Density of the Earth is inferred from the experiments with the torsion apparatus, does in reality consist of so many well-distinguished parts, that it appears desirable to mark the distinction strongly in this essay. For this purpose we shall divide the theory into six different investigations.

1. Investigation of the Attraction of the Masses and Plank upon the Balls, Rod, &c., from the observed times of vibration and the observed displacement of the point of rest.

The investigations, connected with the deduction of the Density of the Earth from the experiments with the torsion apparatus, proceed entirely on the assumption that the force of torsion of a wire is proportional to the angle of torsion from the position of rest; at least, for the small angles of torsion which occur in these experiments. In the use of the apparatus described in the preceding parts of this account, it is further assumed that the places of the attracting masses, in those positions which are distinguished by the signs + and −, are pretty accurately symmetrical (but on opposite sides) with reference to a certain point on the scale of the vibration of the small balls: and that the position, in which the index of the small balls will rest if undisturbed, coincides nearly, but not exactly, with that point to which the + and − positions of the masses are symmetrical.

Suppose then that the reading of the scale (conceived to be prolonged sufficiently far) corresponding to the place of a mass in its + position is A: suppose that the reading for the point of symmetry, to which we have alluded above, is a: and that the reading corresponding to the place of a mass in its − position is A′ (A′ being probably negative). Then, by the assumption of symmetry, $A - a$ is as nearly as possible equal to $a - A'$. Also, suppose that the reading of the division of the scale, at which the balls would rest without the action of the mass, is b; its actual reading at any instant while the ball is in a state of vibration being x. And let the reading of the division, at which the balls would rest under the action of the mass in its + position, be e; and that of the division at which they would rest with the mass in the − position be e'. All these readings, in conformity with the remarks which immediately follow, are to be conceived to be expressed in inches.

Then, by the assumption as to the law of the force of torsion, the torsion force, which urges the ball backwards from the position x, is a multiple of $x - b$, which may be represented by $c(x - b)$. The value of the factor c will depend upon the assumption of the unit of length and of time: if we consider the unit of length to be one inch, and that of time to be one second, then $x - b$ must be supposed to be expressed in inches; and c must be the acceleration (measured as a velocity in inches per second) which the torsion force, acting for one second, would produce in the index when it is at the distance of one inch from its place of rest. Also, the force produced by the attraction of the mass, &c. in its + position (estimated as an acceleration) will depend on the distance of the index from that part of the scale which corresponds to the place of the mass, and therefore may be represented by $\phi(A - x)$; the form of the function represented by ϕ being at present a matter of indifference. Besides this, there is the attraction of the fixed case (or box) and other parts that do not change their position when the masses are shifted from the + position to the − position, which may all be represented by $\psi(x)$; the form of the function ψ being at present unknown. Hence the whole accelerating force, tending to increase x, is $\phi(A - x) + \psi(x) - c \times (x - b)$; and the equation for the motion of the index is therefore

$$\frac{d^2 x}{d t^2} = \phi(A - x) + \psi(x) - c \times (x - b)$$

or $$\frac{d^2 x}{d t^2} = \phi(\overline{A - a} + \overline{a - x}) + \psi(a + \overline{x - a}) - c \times (x - b)$$

Or, since $a - x$ is very small,

$$\frac{d^2 x}{d t^2} = \phi(A - a) + \phi'(A - a) \times \overline{a - x} + \psi(a) + \psi'(a) \times \overline{x - a} - c \times (x - b)$$

$$= \phi(A - a) + a \,.\, \phi'(A - a) + \psi(a) - a \,.\, \psi'(a) + bc - x \times \{\phi'(A - a) - \psi'(a) + c\}$$

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the solution of which, putting $n^2 = c + \varphi'(\mathrm{A} - a) - \psi'(a)$, is

$$x = \frac{1}{n^2}\left\{\varphi(\mathrm{A} - a) + a \,.\, \varphi'(\mathrm{A} - a) + \psi(a) - a \,.\, \psi'(a) + b\,c\right\} + \mathrm{B} \,.\, \sin(n\,t + \mathrm{C});$$

where B and C are constants, of the kind called arbitrary; that is, they are to be so determined that the expression will represent the place and velocity of the index at any one instant, and then it will represent them at any other time.

The expression consists of two parts. The second represents an oscillatory motion, and it shews that the double oscillation is completed while $n\,t$ increases by $2\,\pi$, or while t increases by $\frac{2\,\pi}{n}$. If then T is the time of a double oscillation, $\mathrm{T} = \frac{2\,\pi}{n} = \frac{2\,\pi}{\sqrt{\{c + \varphi'(\mathrm{A} - a) - \psi'(a)\}}}$. The first term represents the value of x which would exist if there were no oscillation; but, as this is evidently the same as the scale-reading for the quiescent point, this first term must $= e$; and hence we have

$$\begin{aligned} e &= \frac{1}{n^2}\left\{\varphi(\mathrm{A} - a) + a \,.\, \varphi'(\mathrm{A} - a) + \psi(a) - a \,.\, \psi'(a) + b\,c\right\} \\ &= \frac{\mathrm{T}^2}{4\,\pi^2}\left\{\varphi(\mathrm{A} - a) + a \,.\, \varphi'(\mathrm{A} - a) + \psi(a) - a \,.\, \psi'(a) + b\,c\right\} \end{aligned}$$

This investigation supposes the mass in its + position.

Now, suppose the mass in its − position. The scale-reading for the index at any moment being supposed $= x$, the distance of the index from the point corresponding to the mass will be $x - \mathrm{A}'$, and therefore the force (measured as an acceleration) which the mass produces on the index, is $\varphi(x - \mathrm{A}')$. The attraction of the fixed parts of the apparatus, as before, will be $\psi(x)$, and the torsion force will be $c\,(x - b)$. The first and third of these forces tend to make x decrease; the second tends to make x increase: and thus, in this case, the equation becomes

$$\begin{aligned} \frac{d^2 x}{d\,t^2} &= -\varphi(x - \mathrm{A}') + \psi(x) - c \times (x - b) \\ &= -\varphi(\overline{a - \mathrm{A}'} + \overline{x - a}) + \psi(a + \overline{x - a}) - c \times (x - b) \end{aligned}$$

or, nearly,

$$\begin{aligned} \frac{d^2 x}{d\,t^2} &= -\varphi(a - \mathrm{A}') - \varphi'(a - \mathrm{A}') \times \overline{x - a} + \psi(a) + \psi'(a) \times \overline{x - a} - c \times (x - b) \\ &= -\varphi(a - \mathrm{A}') + a \,.\, \varphi'(a - \mathrm{A}') + \psi(a) - a \,.\, \psi'(a) + b\,c - x \times \{\varphi'(a - \mathrm{A}') - \psi'(a) + c\} \end{aligned}$$

Since $a - A'$ is equal to $A - a$, this becomes

$$\frac{d^2 x}{d t^2} = -\varphi(A-a) + a\,.\,\varphi'(A-a) + \psi(a) - a\,.\,\psi'(a) + bc - x \times \{\varphi'(A-a) - \psi'(a) + c\}$$

the solution of which, using n in the same sense as before, is

$$x = \frac{1}{n^2}\Big\{-\varphi(A-a) + a\,.\,\varphi'(A-a) + \psi(a) - a\,.\,\psi'(a) + bc\Big\} + B'\,.\,\sin(nt + C')$$

The second term here, as in the former case, represents an oscillatory motion in which the double oscillation is completed in the time $T = \frac{2\pi}{n}$. The first term represents the scale-reading when there is no oscillation, or is the value of e'. Hence we have

$$e' = \frac{T^2}{4\pi^2}\Big\{-\varphi(A-a) + a\,.\,\varphi'(A-a) + \psi(a) - a\,.\,\psi'(a) + bc\Big\}$$

Combining this with the value found above for e, we have

$$e - e' = \frac{T^2}{2\pi^2} \times \varphi(A-a)$$

$$\text{or} \qquad \varphi(A-a) = \frac{2\pi^2}{T^2} \times (e - e')$$

e and e' being expressed in inches: an equation which gives immediately the attraction of the mass upon the balls (considered as an accelerating force upon the index, to be estimated by the velocity which its action during one second will cause, that velocity being measured by the number of inches moved per second) supposing the index in the position which is symmetrically between the + and − positions of the masses, and supposing the masses brought to either the + or the − position. This attraction is given in terms of the observed distance between the two quiescent positions, when the masses are in the + and − positions, and of the observed time of vibration of the balls when the masses are in these positions (not when the masses are distant). It does not require that the quiescent position of the index (masses supposed distant) should coincide strictly with the point symmetrically between the + and − positions: and it is totally independent of the attraction of the fixed parts, and of the law of attraction of the moving masses, &c.

It is scarcely necessary to remark that all which we have said of one mass applies equally to two masses having the same position relatively to the two moving balls.

II. Investigation of the Attraction of the Masses and Plank upon the Balls, Rod, &c., on the Law of Gravitation, with an assumed Modulus of Attraction.

The units of length and time have already been fixed; but in treating of the attractions of particles (the attraction at distance 1 being supposed proportional to the mass of the attracting matter) it becomes necessary to fix upon a unit of mass. The unit which we shall adopt is, the mass which at London weighs one grain: and for the attraction which it produces at distance 1 (estimated as an accelerating force), we shall multiply it by the modulus k.

Now, the moveable part may be conceived to consist of the following portions. 1°. At each end of the rod, the index-piece and arm which carries it, collected at their centre of gravity. 2°. At each end of the rod, the ball collected at its centre of form, or centre of gravity. 3°. The rod, supposed to be uniform. The suspension work at the centre may be neglected.

And the attracting part, whose position is shifted in changing from + to − position, may be considered as consisting of the following portions. 1°. At each end of the plank, the large spherical mass, collected at its centre of form, or centre of gravity. 2°. The plank, supposed to be uniform.

It is necessary now to investigate the attraction of every one of these latter portions upon every one of the former, and to add all together. The following is the notation which we shall use:

a = distance from centre of motion to nearest surface of ball = half length of rod.

b = radius of ball.

$c = a + b$ = distance from centre of motion to centre of ball.

f = distance from centre of motion to centre of gravity of index-piece.

p = ordinate of centre of a mass, measured from the centre of motion parallel to that position of the rod which is symmetrical between the + and − positions of the masses (and for which position the attraction is to be estimated).

q = ordinate of centre of a mass, measured in the horizontal plane perpendicular to p.

r = ordinate of centre of a mass, measured perpendicular to the horizon, from the horizontal plane passing through the centre of the rod.

l = ordinate of the end of the plank measured from the centre of motion parallel to p.

m = ordinate of the end of the plank measured from the centre of motion parallel to q.

n = ordinate of the end of the plank measured from the same horizontal plane passing through the centre of the rod parallel to r.

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Both ends of the plank, and both ends of the rod, are supposed to be in all respects similar. Now,

1°. The differences of co-ordinates of the mass and the index-piece nearest to it are $(p-f)$, q, r. Hence the attraction of the mass on the index-piece nearest to it, in the direction perpendicular to the rod in the horizontal plane, estimated as an accelerating force, is*

$$k \times \text{mass (in grains)} \times \frac{q}{\sqrt{\{(p-f)^2+q^2+r^2\}}} \times \frac{1}{(p-f)^2+q^2+r^2} = \frac{k \times \text{mass} \times q}{\{(p-f)^2+q^2+r^2\}^{\frac{3}{2}}}$$

And since this attraction acts on the matter of the index-piece, the moving force is

$$\frac{k \times \text{mass} \times \text{index-piece} \times q}{\{(p-f)^2+q^2+r^2\}^{\frac{3}{2}}}$$

and its momentum to turn the rod and balls, &c., is

$$\frac{k \times \text{mass} \times \text{index-piece} \times q \times f}{\{(p-f)^2+q^2+r^2\}^{\frac{3}{2}}}$$

The differences of co-ordinates of the mass and the index-piece farthest from it are

$$(p+f),\ q,\ r$$

And, treating these in exactly the same way as those for the nearest index-piece (remarking only that the effort of this attraction to turn the rod, &c., is in the direction opposite to the former) we have for its momentum

$$-\frac{k \times \text{mass} \times \text{index-piece} \times q \times f}{\{(p+f)^2+q^2+r^2\}^{\frac{3}{2}}}$$

And therefore the whole momentum of one mass acting upon the two index-pieces is =

$$k \times \text{mass} \times \text{index-piece} \times f\,q \times \left\{\frac{1}{\{(p-f)^2+q^2+r^2\}^{\frac{3}{2}}} - \frac{1}{\{(p+f)^2+q^2+r^2\}^{\frac{3}{2}}}\right\}$$

This is to be doubled to obtain the effect of the two masses.

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* *Note.*—When the Astronomer Royal favoured me with this communication, the *index-pieces* were in actual use, precisely in the manner employed by Cavendish. But as this method was subsequently abandoned (see page 23), and has not been pursued in any of the experiments recorded in this work, the formulæ 1°, 4° and 7°, which relate solely to this part of the apparatus, are here inapplicable to any of the cases, and might now seem to be unnecessarily retained. Yet, as this investigation completes the comprehensive view which the Astronomer Royal has taken of the whole subject, in all its bearings, and may be of use on other occasions, I have thought proper still to retain it.—F. Baily.

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2°. The momentum of one mass acting upon the two balls, found by exactly the same process, is =

$$k \times \text{mass} \times \text{ball} \times c\,q \times \left\{\frac{1}{\{(p-c)^2+q^2+r^2\}^{\frac{3}{2}}} - \frac{1}{\{(p+c)^2+q^2+r^2\}^{\frac{3}{2}}}\right\}$$

This is to be doubled to obtain the effect of the two masses.

3°. For the attraction of one mass upon the rod; suppose the length of the rod divided into a great number of parts: let the distances, from the centre, of the two sections including one of these parts, be x and $x + \delta x$. Then the matter included between them is $\frac{\text{rod} \times \delta x}{2a}$. The difference between the ordinates of this small quantity of matter (supposed collected in the axis of the rod) and those of the mass are

$$(p-x),\ q,\ r$$

and hence (as above) the momentum of one mass, acting on the small quantity of matter, is

$$k \times \text{mass} \times \frac{\text{rod} \times \delta x}{2a} \times x q \times \frac{1}{\{(p-x)^2+q^2+r^2\}^{\frac{3}{2}}}$$

and therefore that for the rod will be

$$k \times \text{mass} \times \frac{\text{rod} \times q}{2a} \times \int_x \frac{x}{\{(p-x)^2+q^2+r^2\}^{\frac{3}{2}}}$$

The general value of the integral is

$$-\frac{1}{\{(p-x)^2+q^2+r^2\}^{\frac{1}{2}}} - \frac{p}{q^2+r^2} \times \frac{p-x}{\{(p-x)^2+q^2+r^2\}^{\frac{1}{2}}}$$

$$\text{or} \qquad -\frac{p^2+q^2+r^2}{q^2+r^2} \times \frac{1}{\{(p-x)^2+q^2+r^2\}^{\frac{1}{2}}} + \frac{p}{q^2+r^2} \times \frac{x}{\{(p-x)^2+q^2+r^2\}^{\frac{1}{2}}}$$

which, being taken from $x = -a$ to $x = +a$, and being affected with the factor $k \times \text{mass} \times \frac{\text{rod} \times q}{2a}$, gives the momentum of attraction of one mass upon the whole rod =

$$k \times \text{mass} \times \text{rod} \times \frac{pq}{2(q^2+r^2)} \times \left\{\frac{1}{\{(p-a)^2+q^2+r^2\}^{\frac{1}{2}}} + \frac{1}{\{(p+a)^2+q^2+r^2\}^{\frac{1}{2}}}\right\}$$

$$+ k \times \text{mass} \times \text{rod} \times \frac{q(p^2+q^2+r^2)}{2a(q^2+r^2)} \times \left\{\frac{-1}{\{(p-a)^2+q^2+r^2\}^{\frac{1}{2}}} + \frac{1}{\{(p+a)^2+q^2+r^2\}^{\frac{1}{2}}}\right\}$$

This is to be doubled to obtain the effect of the two masses.

4°. For the attraction of the plank upon one index-piece: suppose the matter of the plank to be collected in its axis: and suppose the plank to be divided into a great number of parts by sections transverse to the rod; the distances of two such sections in the direction of a or p being x and $x + \delta x$, the included matter will be plank $\times \frac{\partial x}{2l}$; and the ordinates of this small mass of matter will be $x, \frac{mx}{l}, n$: the differences of its ordinates from those of the index-piece will therefore be

$$(f - x), \frac{mx}{l}, n$$

and the momentum of its attraction will be

$$k \times \text{plank} \times \frac{\partial x}{2l} \times \text{index-piece} \times \frac{f \times \frac{mx}{l}}{\left\{(f-x)^2 + \frac{m^2x^2}{l^2} + n^2\right\}^{\frac{3}{2}}}$$

and the momentum for the whole plank will be

$$k \times \text{plank} \times \text{index-piece} \times \frac{flm}{2} \times \int_x \frac{x}{\{l^2(f-x)^2 + m^2x^2 + l^2n^2\}^{\frac{3}{2}}}$$

The general value of the integral is

$$\frac{1}{f^2m^2 + l^2n^2 + m^2n^2} \times \frac{fx - (f^2 + n^2)}{\{l^2(f-x)^2 + m^2x^2 + l^2n^2\}^{\frac{1}{2}}}$$

which is to be taken from $x = -l$ to $x = +l$, and is then to be affected with the factor $k \times$ plank $\times$ index-piece $\times \frac{flm}{2}$. Thus we find the whole momentum of the plank upon one index-piece =

$$k \times \text{plank} \times \text{index-piece} \times \frac{f^2lm}{2(f^2m^2 + l^2n^2 + m^2n^2)} \times \left\{\frac{1}{\{(f-l)^2 + m^2 + n^2\}^{\frac{1}{2}}} + \frac{1}{\{(f+l)^2 + m^2 + n^2\}^{\frac{1}{2}}}\right\}$$

$$+ k \times \text{plank} \times \text{index-piece} \times \frac{fm(f^2 + n^2)}{2(f^2m^2 + l^2n^2 + m^2n^2)} \times \left\{\frac{-1}{\{(f-l)^2 + m^2 + n^2\}^{\frac{1}{2}}} + \frac{1}{\{(f+l)^2 + m^2 + n^2\}^{\frac{1}{2}}}\right\}$$

This is to be doubled to obtain the effect of the plank upon the two index-pieces.

5°. The momentum of the attraction of the plank upon one ball will be found from the same formula as the last, putting *ball* for *index-piece*, and c for f. It is therefore =

$$k \times \text{plank} \times \text{ball} \times \frac{c^2lm}{2(c^2m^2 + l^2n^2 + m^2n^2)} \times \left\{\frac{1}{\{(c-l)^2 + m^2 + n^2\}^{\frac{1}{2}}} + \frac{1}{\{(c+l)^2 + m^2 + n^2\}^{\frac{1}{2}}}\right\}$$

$$+ k \times \text{plank} \times \text{ball} \times \frac{cm(c^2 + n^2)}{2(c^2m^2 + l^2n^2 + m^2n^2)} \times \left\{\frac{-1}{\{(c-l)^2 + m^2 + n^2\}^{\frac{1}{2}}} + \frac{1}{\{(c+l)^2 + m^2 + n^2\}^{\frac{1}{2}}}\right\}$$

This is to be doubled to obtain the effect of the plank upon the two balls.

6°. The momentum of the attraction of the plank upon the rod will be found most conveniently by dividing the plank into several parts, conceiving each of these parts collected at its centre of gravity, and then computing the momentum of the action of each part on the rod by the formula of the third case: taking care to substitute n for r in that formula. Or it may be found by dividing the rod into several parts, conceiving each of these parts collected at its centre of gravity, and then computing the momentum of the action of the plank on each part by the formula of the fourth case. The momenta corresponding to the different parts must then be added together.

We have hitherto alluded to one plank only: but from the description of the apparatus in the preceding account (see page 12), it appears that there is a lower plank, which supports the other. The attraction of this lower plank upon the index-pieces, the balls, and rod, are determined precisely in the same manner by means of the formulæ 4°, 5°, and 6°.

The whole of the quantities under the six heads are to be computed numerically, with the exception of the factor k, and the result will be

$$\text{Momentum of the Attractions, to produce rotation of the Rod, \&c.} = k \times \mathrm{E}$$

where E is a known numerical expression.

III. Investigation of the Moment of Inertia of the Balls, Rod, &c.

7°. Each index-piece may be supposed to be collected at its centre of gravity: the moment of inertia of one index-piece is then evidently =

$$\text{index-piece} \times f^2$$

This is to be doubled for the two index-pieces.

8°. The balls being heavier, it will scarcely be safe to consider them as collected at their centres of gravity. Putting x and y for the horizontal co-ordinates of any part of a ball as measured from its centre, the quantity which we have to find is the sum of $\{(c+x)^2+y^2\}\delta m$ or $\{c^2+2cx+x^2+y^2\}\delta m$ through the whole extent of the ball. Since there are as many negative values of x as positive ones, of the same magnitude, corresponding to similar parts of the two hemispheres into which the ball will be divided by a plane perpendicular to the rod, these values of $x\delta m$ will mutually destroy each other, and therefore the sum of $2cx.\delta m$ through the mass will $=0$. Also the sum of $c^2\delta m$ through the mass is evidently $= c^2 \times$ ball. Then let $x^2+y^2=r^2$: we

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have only to ascertain the sum of $r^2\delta m$ through the mass, where r is evidently the distance of any particle from the vertical axis passing through the centre of the sphere. If the sphere be divided by horizontal planes, of which two correspond to vertical ordinates z and $z+\delta z$, and if the included lamina be divided into rings, the internal and external radii of one being r and $r+\delta r$; then the volume in that ring is $2\pi r.\delta r.\delta z$ nearly; the matter in it is ball $\times 2\pi r.\delta r.\delta z \times \frac{3}{4\pi b^3} =$ ball $\times \frac{3\delta z}{2b^3} \times r\,\delta r$; the value of $r^2\delta m$ for the ring is ball $\times \frac{3\delta z}{2b^3} \times r^3\delta r$; that for the lamina, is ball $\times \frac{3\delta z}{2b^3} \times \int_r r^3 =$ ball $\times \frac{3\delta z}{8b^3} \times r^4$, which, taken to the surface of the sphere, is ball $\times \frac{3\delta z}{8b^3} \times (b^2-z^2)^2$; and, therefore, the value of $r^2\delta m$ for the sphere is

$$\text{ball} \times \frac{3}{8b^3} \times \int_z (b^4 - 2b^2z^2 + z^4) = \text{ball} \times \frac{3}{8b^3} \times \left(b^4z - \frac{2}{3}b^2z^3 + \frac{z^5}{5}\right)$$

which, taken from $z = -b$ to $z = +b$, gives for the whole sphere

$$\text{ball} \times \frac{3}{8b^3} \times \frac{16}{15}b^5 = \text{ball} \times \frac{2b^2}{5}$$

And therefore the whole moment of inertia of one ball =

$$\text{ball} \times \left(c^2 + \frac{2b^2}{5}\right)$$

This is to be doubled to obtain the moment of inertia for the two balls.

9°. For the moment of inertia of the rod: suppose it to be divided into small parts by cross sections, of which two are at the distances s and $s+\delta s$ from the centre; the included matter $= \frac{\text{rod}}{2a} \times \delta s$, its moment of inertia $= \frac{\text{rod}}{2a} \times s^2\delta s$, and therefore that for the whole rod $= \frac{\text{rod}}{2a} \times \int_s s^2 = \frac{\text{rod}}{6a} \times s^3$; which taken from $s = -a$ to $s = +a$, gives the moment of inertia for the whole rod =

$$\text{rod} \times \frac{a^2}{3}$$

The three quantities under the heads 7°, 8°, and 9° are to be computed numerically, leaving no part in a symbolical form. Their sum will give

Whole Moment of Inertia = F

where F is a known numerical expression.

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IV. Investigation of the Accelerating Force upon the Index, in terms of the Modulus of Attraction: and deduction of the value of the Modulus from Experiment.

Put i for the distance of the index from the centre, h for the value of one of the divisions of its scale. It is almost needless to observe, that if a fixed scale is observed with a fixed telescope directed to a mirror carried by the rod at its centre, the value taken for h must be one-half of its real value; since in this manner the simple angular motion of the rod will be truly represented. But if the index is farther from the telescope than the scale is, the scale being traced upon glass; then the value to be taken for h is the projection of the scale-value, as seen from the object-glass of the telescope, upon the index; and is, therefore, greater than the actual scale-value, in the proportion of the distance of the index from the telescope to that of the glass-scale from the telescope.

Now the angular accelerating force of the impressed attraction is $\frac{k\,\mathrm{E}}{\mathrm{F}}$. Hence the accelerating force on the index is $\frac{k\,\mathrm{E}}{\mathrm{F}} \times i$. This is the same quantity which, in Investigation I, we have called $\phi\,(\mathrm{A} - a)$; and consequently,

$$\frac{k\,\mathrm{E}}{\mathrm{F}} \times i = \frac{2\,\pi^2}{\mathrm{T}^2} \times (e - e')$$

where, as is remarked in Investigation I, e and e' are supposed to be expressed in inches.

Now let s be the scale-reading corresponding to the quiescent place of the rod when the masses are in + position, and s' that for the quiescent place when the masses are in − position; then $e - e' = (s - s') \times h$; the value of h being taken with the cautions mentioned above. Consequently $\frac{k\,\mathrm{E}}{\mathrm{F}} \times i = \frac{2\,\pi^2}{\mathrm{T}^2} \times h \times (s - s')$; and therefore

$$k = \frac{2\,\pi^2 . \mathrm{F} . h}{\mathrm{E} . i} \times \frac{s - s'}{\mathrm{T}^2}$$

where the last factor only is obtained from the observation in any individual experiment.

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V. Deduction of the value of the Modulus from Pendulum observations, on an assumed value for the Mean Specific Gravity of the Earth.

Put Δ for the Earth's mean specific gravity, or mean density, as compared with water; G for the number of grains in a cubic inch of water; then $\Delta.G$ is the number of grains in a cubic inch of matter of the Earth's mean density. Also put R for the Earth's polar radius (in inches), M for the proportion of centrifugal force at the equator to gravity there ($= \frac{1}{289}$ nearly), ε for the Earth's ellipticity ($= \frac{1}{300}$ nearly). Then the theory of the figure of the Earth gives as the expression for gravity, or g (estimated as an accelerating force) at any part of the Earth's surface,

$$g = k \times \frac{\text{mass of the Earth}}{R^2} \times \left\{1 - 2\varepsilon + M - \left(\frac{5M}{2} - \varepsilon\right) \cos^2 \text{latitude}\right\}$$

But the mass of the Earth = volume of Earth in cubic inches × mean mass in one cubic inch $= \frac{4\pi}{3} R^3 (1 + 2\varepsilon) \times \Delta.G$. Therefore the expression for g is

$$g = k \times \Delta.G \times \frac{4\pi}{3} R \times \left\{1 + M - \left(\frac{5M}{2} - \varepsilon\right) \cos^2 \text{latitude}\right\}.$$

Let $L =$ the length of the seconds' pendulum in the same latitude; then $L = \frac{g}{\pi^2}$; or

$$L = k \times \Delta.G \times \frac{4}{3\pi} R \times \left\{1 + M - \left(\frac{5M}{2} - \varepsilon\right) \cos^2 \text{latitude}\right\}$$

and therefore

$$k = \frac{3\pi}{4} \times \frac{L}{\Delta.G.R \times \left\{1 + M - \left(\frac{5M}{2} - \varepsilon\right) \cos^2 \text{latitude}\right\}}$$

VI. Elimination of the Modulus, and expression of the Earth's Mean Specific Gravity in terms of the numbers of Experiment.

We have just found a value for k from the observed length of the pendulum: in the fourth investigation we found the value $k = \frac{2\pi^2.F.h}{E.i} \times \frac{s - s'}{T^2}$ from the torsion experiment. Making the two values of k equal,

$$\frac{2\pi^2.F.h}{E.i} \times \frac{s - s'}{T^2} = \frac{3\pi}{4} \times \frac{L}{\Delta.G.R \times \left\{1 + M - \left(\frac{5M}{2} - \varepsilon\right) \cos^2 \text{latitude}\right\}}$$

whence

$$\Delta = \frac{3}{8\pi} \times \frac{\mathrm{L}}{\mathrm{G.R} \times \left\{1 + \mathrm{M} - \left(\frac{5\,\mathrm{M}}{2} - \varepsilon\right)\cos^2 \text{latitude}\right\}} \times \frac{\mathrm{E}.i}{\mathrm{F}.h} \times \frac{\mathrm{T}^2}{s - s'},$$

in which expression the first factor is an abstract number; the second is a number depending only upon the dimensions of the Earth and the seconds' pendulum; the third depends only on the dimensions of the apparatus; and the fourth depends only on the observations in any individual experiment.

It must be observed that the weights of the masses, balls, planks, and torsion rods are assumed to be such as they would be, if weighed *in vacuo;* and the length of the pendulum also, the same as if the vibrations were made *in vacuo.*

---

§ 24. *The Numerical Determination of the Constants.*

The preceding section, by the Astronomer Royal, will have sufficiently explained the principles from which the analytical determination of the constants is derived: and it therefore only remains now for me to shew in what manner I have proceeded in order to deduce their numerical value. This is the more requisite, as some of the steps of the process are of an arbitrary nature; and others, perhaps, not sufficiently definite, from the verbal descriptions of the various parts and positions of the apparatus, already given.

Let the figure G I K N, in the accompanying wood-cut, denote a portion of the upper wooden plank (see page 12) that supports the masses, moving round an axis of motion, which is the same as that of the torsion rod: also let M be the centre of the mass, B the centre of the ball, and C the centre of motion of the torsion rod C A, all in the same horizontal plane, which is 6 inches above the upper surface of the plank. When the masses are brought up to their near position (as here represented) I have so contrived the arrangement of the apparatus, that a line M D, drawn from the centre of the mass, perpendicular to the zero line of the torsion rod, should be exactly 11 inches in length: any slight deviation therefrom, that may occasionally occur, being easily corrected by a small table to which I have alluded in the note in page 54.

The distance M D having been thus assumed equal to 11 inches, and the distance C M having been determined to be 40·8335 inches (see page 17),

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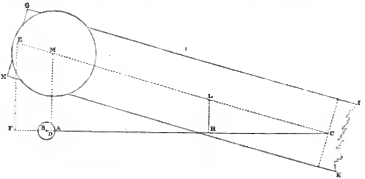
we have the angle $MCD = 15° 37' 40''$; which enables us to determine some other numerical quantities, essential to the present solution of Mr. Airy's formulæ. Thus, the length of the upper plank being $92\frac{1}{2}$ inches, and that of the lower plank being 36 inches (see page 12), we have $CE = 46{\cdot}25$ and $CL = 18{\cdot}00$; and consequently the following numerical values for Mr. Airy's p, q, l, m, l', m', when measured in their respective planes.*



$$
\begin{aligned}
p &= CD = 40{\cdot}8335 \times \cos 15° 37' 40'' = 39{\cdot}325 \\
q &= MD = \text{assumed} \ldots\ldots\ldots\ldots\ldots = 11{\cdot}000 \\
l &= CF = 46{\cdot}2500 \times \cos 15\ 37\ 40 = 44{\cdot}541 \\
m &= EF = 46{\cdot}2500 \times \sin 15\ 37\ 40 = 12{\cdot}459 \\
l' &= CH = 18{\cdot}0000 \times \cos 15\ 37\ 40 = 17{\cdot}335 \\
m' &= LH = 18{\cdot}0000 \times \sin 15\ 37\ 40 = 4{\cdot}849
\end{aligned}
$$

The value of r vanishes in all the cases where the *masses* are involved in the computation, because the centres of the masses are here assumed to move in the same horizontal plane as the torsion rod and the balls; and any slight deviation therefrom not materially affecting the results.† But, where the attraction of the *planks* is concerned, it is requisite, on account of their lower position, to take into account the vertical distance of the horizontal planes of each plank, from the horizontal plane of the torsion rod and the balls. Now, the centre of the balls being 6 inches above the surface of the upper plank, and that plank being 2½ inches thick, we have the vertical distance (n) between the horizontal plane of the balls and the horizontal plane of the *middle* of this plank, equal to 7·25 inches. And the lower plank being 2¾ inches thick,* we have the vertical distance (n') between the horizontal plane of the balls and the horizontal plane of the *middle* of this plank, equal to 9·875 inches. I shall presently revert again to these quantities.

---

* The values, here designated by the letters l, m, refer to the *upper* plank; and the letters l', m', to the *lower* plank. In a subsequent part of this section, I have adopted a similar designation for n and n'.

† When the apparatus was first put up, the centres of the masses and of the balls were precisely in the same horizontal plane: but when the index-pieces were removed, and the glass mirror affixed to the centre of the torsion-rod, it was requisite to raise the torsion-rod, in order to prevent the mirror from touching the bottom of the box. The difference in the elevation probably did not exceed a quarter of an inch; and no regard has been paid to it, in the computations.

In the mean time I would advert to a correction which is requisite to be applied to some other quantities involved in this inquiry: I allude here to the *weights* of the several parts of the apparatus, affecting the results; such as the masses, the balls, and the torsion rods, as they are severally given in pages 16, 22 and 25 from actual experiment. The values there mentioned are the determinations made in the usual way *in air;* but it is requisite to reduce these weights to such as they would be, if made *in vacuo*. The weights of the planks (which have not yet been alluded to) were computed from their dimensions, and their assumed specific gravity (= 0·589): whence the weight of the upper plank was estimated at 344400 grains, and the lower plank at 147440 grains. When the apparatus was dismounted, I caused the upper plank to be actually weighed; and the result shewed that my estimate was sufficiently correct, and that the difference was not appretiable.

In order to reduce the several weights, above alluded to, to such as they would be if made *in vacuo*, I have made use of the common formula:

$$\text{weight } in\ vacuo = \mathrm{W} \times \left(1 + \frac{\text{specific gravity of air}}{\text{specific gravity of the body}}\right)$$

where W denotes the weight of the body in air. The specific gravity of air has been assumed equal to ·00123. By means of this formula I have deduced the weights (*in vacuo*) of the masses, the planks, the balls, and the torsion rods, as they are employed in the computations of the several quantities required. Their respective values will be seen in the lists given in the two following pages.

---

* In page 12 it is erroneously stated that both the planks are of the same thickness: but the upper plank is 2½ inches thick, whilst the lower one is 2¾ inches, as here assumed.

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I shall now proceed to state the numerical values of the several quantities indicated in Mr. Airy's formulæ; arranging, in the first instance, those quantities which are common to all the cases in general, and afterwards those which vary according to some special circumstances. Those which are common to *all* the cases are as follow :*

$$\left.\begin{array}{lr} CD = & p = 39{\cdot}325 \\ MD = & q = 11{\cdot}000 \\ & r = 0{\cdot}000 \\ CF = & l = 44{\cdot}541 \\ EF = & m = 12{\cdot}459 \\ & n = 7{\cdot}250 \\ CH = & l' = 17{\cdot}335 \\ LH = & m' = 4{\cdot}849 \\ & n' = 9{\cdot}875 \end{array}\right\}\text{Distance, in inches.}$$

$$\left.\begin{array}{lr} \text{Each mass} & = 2663570 \\ \tfrac{1}{2}\text{ upper plank} = & 172560 \\ \tfrac{1}{2}\text{ lower plank} = & 73874 \end{array}\right\}\text{Weight, in grains, } \textit{in vacuo.}$$

Those quantities which vary according to circumstances are much more numerous, since they depend not only on the weight and diameter of the balls, but also on the weight and length of the torsion rod. And although, by their number as here exhibited, the cases may have the appearance of more complexity, yet it will be found that each case depends on its own peculiar circumstances; that they are all independent of each other; and that there is no greater ambiguity in the mode of operation, by this variation, than if the whole of the experiments had been carried on with an apparatus of an uniform construction. The following table, which embraces every case that occurs in these experiments, will exhibit this in a clear point of view; and by the arrangement here adopted the computations may be readily examined.

---

* As the *index-pieces*, originally attached to the torsion rod, were subsequently removed, agreeably to what has been stated in page 23, and the note in page 104, it is not requisite here to notice the value of *f*, nor the formulæ in which it is involved.

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	2½-inch Lead.	2-inch Lead.	2½-inch Brass.	1½-inch Platina.	2-inch Zinc.	2-inch Glass.	2-inch Ivory.	2-inch Ivory with small rod.	2½-inch Lead with brass rod.	2-inch Lead with brass rod.	Brass rod alone.
AC = a =	38·375	38·690	38·690	39·238*	38·690	38·690	38·690	38·690	38·715	38·715	38·715
AB = b =	1·279	1·030	1·262	·736	1·006	1·006	1·006	1·006	1·279	1·030	
CB = c =	39·654	39·720	39·952	39·974	39·696	39·696	39·696	39·696	39·994	39·745	
$(p-c)$ =	−·329	−·395	−·627	−·649	−·371	−·371	−·371	−·371	−·669	−·420	
$(p+c)$ =	78·979	79·045	79·277	79·299	79·021	79·021	79·021	79·021	79·319	79·070	
$(p-a)$ =	·950	·635	·635	·087	·635	·635	·635	·635	·610	·610	·610
$(p+a)$ =	77·700	78·015	78·015	78·563	78·015	78·015	78·015	78·015	78·040	78·040	78·040
$(c-l)$ =	−4·887	−4·821	−4·589	−4·567	−4·845	−4·845	−4·845	−4·845	−4·547	−4·796	
$(c+l)$ =	84·195	84·261	84·493	84·515	84·237	84·237	84·237	84·237	84·535	84·826	
$(c-l')$ =	22·319	22·385	22·617	22·639	22·361	22·361	22·361	22·361	22·659	22·410	
$(c+l')$ =	56·989	57·055	57·287	57·309	57·031	57·031	57·031	57·031	57·329	57·080	
Weight *in vacuo* of one ball	23744·6	11942·3	8984·3	8957·5	7580·3	3497·3	1951·3	1951·3	23744·6	11942·3	
Weight *in vacuo* of the rod	2375·0	2224·6	2224·6	2274·6	2224·6	2224·6	2224·6	771·6	22167·3	22167·3	22167·3

In the subsequent computations, the *mean* of the several values of $(c-l')$ and of $(c+l')$ have been assumed for *all* the cases.

The numerical computations of most of the formulæ are very simple, and, by means of the principal elements here given, do not involve any great trouble or difficulty: but the formula 6°, which depends on an arbitrary assumption, requires some further explanation of the steps which I have pursued in deducing the results, in order that they may be examined if required. In this formula, each half of the *upper* plank has been divided into six equal portions:† consequently each portion will weigh (*in vacuo*) 28760 grains; and the value of p and q, corresponding to the *centre of gravity* of each portion, will be respectively,

$p' = 3·712$ $\qquad$ $q' = 1·038$
$p'' = 11·135$ $\qquad$ $q'' = 3·115$
$p''' = 18·558$ $\qquad$ $q''' = 5·191$
$p^{\text{iv}} = 25·982$ $\qquad$ $q^{\text{iv}} = 7·268$
$p^{\text{v}} = 33·405$ $\qquad$ $q^{\text{v}} = 9·344$
$p^{\text{vi}} = 40·829$ $\qquad$ $q^{\text{vi}} = 11·421$

---

* In the case of the platina balls, half the length of the torsion rod (= 38·690) has been increased by ·548 inch, on account of the shank attached to the *calotte*, mentioned in page 22.

† I had originally divided this plank into *four* equal parts: but, having afterwards conceived that this might not be attended with sufficient accuracy, I divided it into *six* portions. The difference does not appear to be of much importance.

In all the cases, where these quantities are involved, the value of a has been assumed equal to 38·690; and we therefore have, for each case respectively,

$$\begin{array}{ll}
(p' - a) = -34{\cdot}978 & (p' + a) = 42{\cdot}402 \\
(p'' - a) = -27{\cdot}555 & (p'' + a) = 49{\cdot}825 \\
(p''' - a) = -20{\cdot}132 & (p''' + a) = 57{\cdot}248 \\
(p^{iv} - a) = -12{\cdot}708 & (p^{iv} + a) = 64{\cdot}672 \\
(p^{v} - a) = -\ 5{\cdot}285 & (p^{v} + a) = 72{\cdot}075 \\
(p^{vi} - a) = +\ 2{\cdot}139 & (p^{vi} + a) = 79{\cdot}519
\end{array}$$

the value of n is constant, and equal to 7·250 in all the six cases.

Each half of the *lower* plank has been divided into four equal portions: consequently each portion will weigh (*in vacuo*) 18468 grains; and the value of p and q, corresponding to the *centre of gravity* of each portion, will be respectively,

$$\begin{array}{ll}
p' = 2{\cdot}167 & q' = 0{\cdot}606 \\
p'' = 6{\cdot}500 & q'' = 1{\cdot}818 \\
p''' = 10{\cdot}834 & q''' = 3{\cdot}030 \\
p^{iv} = 15{\cdot}168 & q^{iv} = 4{\cdot}243
\end{array}$$

In all the cases likewise in which these quantities are involved, the value of a has been assumed equal to 38·690; and we therefore have, for each case respectively,

$$\begin{array}{ll}
(p' - a) = -36{\cdot}523 & (p' + a) = 40{\cdot}857 \\
(p'' - a) = -32{\cdot}190 & (p'' + a) = 45{\cdot}190 \\
(p''' - a) = -27{\cdot}856 & (p''' + a) = 49{\cdot}524 \\
(p^{iv} - a) = -23{\cdot}522 & (p^{iv} + a) = 53{\cdot}858
\end{array}$$

the value of n' is here also constant, and equal to 9·875 in all the four cases.

By means of the numerical quantities, which have been now given, the amount of the force of attraction and of the moment of inertia, (or, the values of E and F in Mr. Airy's general formula) may be readily determined for any of the cases that have occurred in the present work; which vary from each other according to the circumstances in the disposition and arrangement of the apparatus. But, there is another portion of that formula, where the quantities are either constant, and therefore applicable to every case, or else determinable (like the time, the deviation, and the distance) in each experiment. I shall now proceed to shew how these have been deduced.

In the general formula, in page 111, T denotes the time of a *double*

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oscillation; and $(s-s')$ denotes the *whole* arc indicated by the torsion rod, when the masses are shifted from their + to − position. But, as the time alluded to, throughout the whole of this work, (and that indeed which has been deduced and acted upon, in Tables I. and II.) has reference only to the time of *one* oscillation of the torsion rod; and as the deviation likewise has relation only to the *semi*-arc indicated by the torsion rod, it is requisite to substitute the expressions (N and D) for these values instead of those adopted in the formula given by the Astronomer Royal. Now, since $T^2 = 4\,N^2$, and $(s-s') = 2\,D$, the general formula, above alluded to, becomes

$$\Delta = \frac{3}{4\pi} \times \frac{L}{G.R \times \left\{1 + M - \left(\frac{5\,M}{2} - \epsilon\right)\cos^2 \text{lat.}\right\}} \times \frac{i}{h} \times \frac{E}{F} \times \frac{N^2}{D}$$

where the several factors, except the first and the last, are precisely the same as those stated in page 111.

The first three factors here given constitute the general constant, applicable to all the cases; which, being combined with $\frac{E}{F}$, form the special constant for each individual case, and is the quantity denoted by C, in page 54. In determining the value of the general constant, I have assumed the polar radius of the Earth equal to 3949 miles, each being 63360 inches in length. The weight of a cubic inch of water has been assumed equal to 252·725 grains. The length of the pendulum, swung *in vacuo*, has been taken at 39·139 inches, as described by Act of Parliament, although there is no doubt that it is not strictly correct: but we have no other determination that can be implicitly relied on.* The latitude of the place is 51° 31′ 26″. The distance of the scale from the glass mirror is 108 inches: and each division of the scale is $\frac{1}{13}$ of an inch, but has been assumed equal to $\frac{1}{2} \times \frac{1}{13}$, agreeably to the remark made by the Astronomer Royal, in page 109.†

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* The length of the pendulum, mentioned in the Act of Parliament, is taken from KATER's determination: but it is now known that that determination is not the true one, inasmuch as the correction for the buoyancy of the atmosphere should be nearly as much again as that which he has assumed, and consequently the length somewhat longer. But some subsequent experiments, with the same pendulum, by Col. SABINE, make the length somewhat shorter. It is much to be regretted that this important element is not more accurately known.

† See also, on this subject, in page 24.

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We have therefore the expression for the general constant, in logarithms, as follows:

$$
\begin{array}{rr}
 3 = & 0{\cdot}4771213 \\
L = \qquad 39{\cdot}139 = & 1{\cdot}5926097 \\
i = \qquad 108 = & 2{\cdot}0334238 \\
\hline
 & 4{\cdot}1031548 \\
\hline
\\
4\pi = & 1{\cdot}0992099 \\
G = \qquad 252{\cdot}725 = & 2{\cdot}4026492 \\
R = 3949 \times 63360 = & 8{\cdot}3983023 \\
1 + M - \left(\frac{5M}{2} - \epsilon\right)\cos^2 \text{lat.} = & 0{\cdot}0006076 \\
h = \qquad \frac{1}{26} = & 8{\cdot}5850206 \\
\hline
 & 0{\cdot}4857896
\end{array}
$$

Therefore **$4{\cdot}1031548 - 0{\cdot}4857896 = 3{\cdot}6173652$** is the logarithm of the general constant, which has been employed in all the subsequent values of the special constants, as may be seen on the opposite page.

The following table will shew the numerical values of the several formulæ corresponding to the several cases that have occurred; namely, those depending on the weight and diameter of the balls, or on the weight and length of the torsion rod employed. The force of the *attraction* of the masses and of the two planks, on the balls and on the torsion rod, are kept distinct from each other; as are likewise the moment of *inertia* of the balls and of the torsion rod; in order that any source of error may be readily detected and corrected. Below this arrangement are placed the logarithms of the sums of these quantities: and to the *difference* of these logarithms is added the logarithm of the general constant, above given. The last line in each column therefore shews the logarithm of the *special constant* that is employed in each case respectively.

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			2½-inch Lead.	2-inch Lead.	2½-inch Brass.	1½-inch Platina.	2-inch Zinc.
Attraction	Masses	on Balls ….	41286300000	20788643000	15685050000	15641479000	13190427000
		on Rod ….	391803800	379088100	379088100	409347480	379088100
	Planks	on Balls ….	567163000	284597300	212901340	211773770	180851200
		on Rod ….	19821800	18567255	18567255	18985440	18567255
Sum of Attractions ……			42265088600	21470895655	16295606695	16281585690	13768933555
Inertia……….		on Balls ….	74712400	37692478	28742566	28630730	23895844
		on Rod ….	1165818	1110030	1110030	1167413	1110030
Sum of Inertia ……….			75878218	38802508	29852596	29798143	25005874
log. sum of Attractions ……..			10·6259818	10·3318501	10·2120706	10·2116968	10·1389004
log. sum of Inertia…………			7·8801171	7·5888597	7·4749821	7·4741902	7·3980420
			2·7458647	2·7429904	2·7370885	2·7375066	2·7408584
log. General Constant ……..			3·6173652	3·6173652	3·6173652	3·6173652	3·6173652
log. Special Constant……….			6·3632299	6·3603556	6·3544537	6·3548718	6·3582236

			2-inch Glass.	2-inch Ivory.	2-inch Ivory with small rod.	2½-inch Lead with brass rod.	2-inch Lead with brass rod.	Brass rod *alone*.
Attraction	Masses	on Balls	6085650000	3395463200	3395463200	41469710000	20806450000	
		on Rod	379088100	379088100	131491660	3787261000	3787261000	3787261000
	Planks	on Balls	83439080	46554470	46554470	561013265	284597300	
		on Rod	18567255	18567255	6440000	185012260	185012260	185012260
Sum of Attractions….			6566744435	3839673025	3579949330	46002996525	25063320560	3972273260
Inertia ……….		on Balls	11024790	6151239	6151239	75991000	37737780	
		on Rod	1110030	1110030	385011	11075130	11075130	11075130
Sum of Inertia………			12134820	7261269	6536250	87066130	48812910	11075130
log. sum of Attractions ….			9·8173501	9·5842942	9·5538768	10·6627861	10·3990387	9·5990391
log. sum of Inertia ……..			7·0840334	6·8610125	6·8153286	7·9398492	7·6885347	7·0443488
			2·7333167	2·7232817	2·7385482	2·7229369	2·7105040	2·5546903
log. General Constant ….			3·6173652	3·6173652	3·6173652	3·6173652	3·6173652	3·6173652
log. Special Constant ……			6·3506819	6·3406469	6·3559134	6·3403021	6·3278692	6·1720555

The logarithm of the special constant, that has been employed in each respective case, is noted at the close of each series in Table II: and its accuracy may be examined by means of the details here given. The values of $\frac{N^2}{D}$ are determined by observation, as already mentioned in page 54.

There is now only one other portion of this inquiry, to which it is necessary to allude, in order to complete the description of the method of computation here pursued; and this is the correction for the variation in the distance of the masses, between the assumed distance of 11 inches and the distance actually observed in each experiment. If we suppose the observed distance to be expressed by δ, the computed result must be corrected by the quantity $\frac{\delta^2}{(11)^2}$: see page 54, and the note there given. The following table will shew the logarithm to be added to the logarithm of the result, in all the cases that occur in the present work, where the distance between the masses and the balls is greater or less than 11 inches.

δ in inches.	0	1	2	3	4	5	6	7	8	9
10·9900	0·0007893	7813	7734	7655	7576	7497	7419	7340	7262	7182
10	7104	7024	6945	6866	6787	6708	6630	6551	6473	6393
20	6314	6235	6156	6077	5998	5919	5841	5762	5640	5604
30	5525	5446	5367	5288	5209	5130	5052	4973	4895	4815
40	4736	4656	4577	4498	4419	4340	4262	4183	4105	4026
50	3946	3867	3788	3709	3630	3551	3473	3394	3316	3236
60	3157	3078	2999	2920	2841	2762	2684	2605	2527	2447
70	2368	2288	2209	2130	2051	1972	1894	1815	1737	1657
80	1579	1499	1420	1341	1262	1183	1105	1026	0948	0868
90	0789	0710	0631	0552	0473	0394	0316	0237	0159	0079
11·0000	9·9999999	9921	9841	9762	9683	9604	9526	9447	9369	9289
10	9211	9131	9052	8973	8894	8815	8737	8658	8579	8500
20	8421	8342	8263	8184	8105	8026	7948	7869	7790	7711
30	7632	7552	7473	7394	7315	7236	7158	7079	7000	6921
40	6843	6763	6684	6605	6526	6447	6369	6290	6211	6132
50	6053	5974	5895	5816	5737	5658	5580	5501	5422	5343
60	5264	5184	5105	5026	4947	4868	4790	4711	4632	4553
70	4475	4395	4316	4237	4158	4079	4001	3922	3843	3764
80	3686	3606	3527	3448	3369	3290	3212	3133	3054	2975
90	2896	2817	2738	2659	2580	2501	2423	2344	2265	2186
100	2107	2027	1948	1869	1791	1711	1633	1554	1475	1396
110	1318	1238	1159	1080	1001	0922	0844	0765	0686	0607

(*Here follow the Tables.*)

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TABLE I.

The *first* column contains the date of the observations. Immediately below this date, is stated the mean of the readings of the six thermometers within the octagonal frame, as recorded *prior* to the commencement of the day's observations; and also the height of the barometer at the same time. At the close of that column, on the same day, are stated the results of similar readings, recorded at the *close* of the experiments.

The *second* column indicates the ordinal number of the experiment to which it is affixed.

The *third* column denotes the position of the masses, or the side of the torsion box on which they are placed and continue, during the period of the experiment.

The *fourth* column shews the divisions of the scale at which the torsion rod appears to rest or stop, when at its extreme point, and about to turn.

The *next three* columns contain respectively the first, second, and third means of those observed divisions: the last of which is the *mean resting point* employed in the computations.

The *eighth* and *ninth* columns denote respectively the hours, minutes, and seconds, at which the centre wire of the telescope appears to cut the divisions of the scale, which are marked at the top.

The *tenth* and *eleventh* columns indicate the number of minutes and seconds occupied by the torsion rod in making two vibrations, assumed as starting from each of those divisions respectively; the half of which (inserted under the line) is the time occupied by the torsion rod in making one vibration, in each case.

The *twelfth* and last column is the computed time of one vibration of the torsion rod, the middle of which vibration is assumed to be the mean resting point stated in the seventh column.

1st SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Jan. 24 T = 40·25 B = 29·830	1	Pos.	101·60 120·70 102·60 120·10	111·150 111·650 111·350	111·400 111·500	111·450	at div. 111 10 23 0 31 0 38 30	at div. 112 10 23 15 30 44 38 47	by div. 111 15 30,0 7 45,0	by div. 112 15 32,0 7 46,0	* 465,450
	2	Neg.	120·10 69·80 117·10 71·30	94·950 93·450 94·200	94·200 93·825	94·012	at div. 90 10 47 29 54 31 11 3 13	at div. 95 10 46 59 55 3 11 2 40	by div. 90 15 44,0 7 52,0	by div. 95 15 41,0 7 50,5	470,796
	3	Pos.	71·30 147·90 74·00 144·80	109·600 110·950 109·400	110·275 110·175	110·225	at div. 110 11 11 0 18 47 26 38	at div. 115 11 11 19,5 18 27 26 59	by div. 110 15 38,0 7 49.00	by div. 115 15 39.5 7 49.75	469,034
T = 40·40 B = 29·846	4	Neg.	144·80 41·50 139·60 44·90	93·150 90·550 92·250	91·850 91·400	91·625	at div. 90 11 34 43,5 42 27 50 25	at div. 95 11 34 29 42 42 50 9,5	by div. 90 15 41.5 7 50,75	by div. 95 15 40.5 7 50,25	470,588
Jan. 25 T = 37·70 B = 30·340	5	Pos.	100·00 116·90 101·30 116·70	108·450 109·100 109·000	108·775 109·050	108·912	at div. 108 9 44 35 52 37 59 35	at div. 109 9 44 52 52 18 59 54,5	by div. 108 15 0,0 7 30,00	by div. 109 15 2,5 7 31,25	451,140
	6	Neg.	116·70 70·10 116·30 71·60	93·400 93·200 93·950	93·300 93·575	93·437	at div. 90 10 8 32,5 15 31 23 53	at div. 95 10 8 0,5 16 3 23 20,5	by div. 90 15 20,5 7 40,25	by div. 95 15 20,0 7 40,00	460,078
	7	Pos.	71·60 148·30 75·00 147·60	109·950 111·650 111·300	110·800 111·475	111·137	at div. 110 10 31 24,5 39 3 46 27	at div. 115 10 31 44 38 43 46 47	by div. 110 15 2,5 7 31,25	by div. 115 15 3,0 7 31,50	451,307
T = 37·73 B = 30·326	8	Neg.	147·60 45·30 145·30 47·80	96·450 95·300 96·550	95·875 95·925	95·900	at div. 95 10 54 21,5 11 1 53 9 31,5	at div. 100 10 54 7 11 2 7,5 9 16,5	by div. 95 15 10,0 7 35,00	by div. 100 15 9,5 7 34,75	454,955
Jan. 27 T = 43·20 B = 30·068	9	Pos.	106·00 126·80 107·40 125·80	116·400 117·100 116·600	116·750 116·850	116·800	at div. 116 9 47 6 55 56 10 3 54	at div. 117 9 47 21,5 55 40 10 4 11,5	by div. 116 16 48,0 8 24,0	by div. 117 16 50.0 8 25,0	504,800
	10	Neg.	125·80 69·40 121·80 72·50	97·600 95·600 97·150	96·600 96·375	96·487	at div. 95 10 13 27 21 37 30 17	at div. 100 10 12 58 22 7,5 29 44,5	by div. 95 16 50,0 8 25,00	by div. 100 16 46,5 8 23,25	504,480
	11	Pos.	72·50 157·60 78·30 152·90	115·050 117·950 115·600	116·500 116·775	116·637	at div. 115 10 38 52,5 47 28 55 38	at div. 120 10 39 11,5 47 8 56 0	by div. 115 16 45,5 8 22,75	by div. 120 16 48,5 8 24,25	503,241
Continued.	12	Neg.	152·90 43·70 145·40 50·00	98·300 94·550 97·700	96·425 96·125	96·275	at div. 95 11 4 29,5 12 45,5 21 15,5	at div. 100 11 4 15 13 1,5 20 59	by div. 95 16 46 8 23,0	by div. 100 16 44,0 8 22,0	502,745

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1st SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	13	Pos.	50·00 177·80 59·30 170·00	113·900 118·550 114·650	116·225 116·600	116·412	at div. 115 11 29 48,0 38 16 46 31	at div. 120 11 30 0,5 38 2 46 45,5	by div. 115 16 43.0 8 21,5	by div. 120 16 45,0 8 22,5	• 501,782
T = 43·76 B = 30·110	14	Neg.	170·00 27·50 160·10 35·90	98·750 93·800 98·000	96·275 95·900	96·087	at div. 95 11 55 12 0 3 28 11 54.5	at div. 100 11 55 0,5 0 3 40,5 11 41,5	by div. 95 16 42,5 8 21,25	by div. 100 16 41.0 8 20,50	501,087
Jan. 28 T = 44·43 B = 30·326	15	Pos.	106·10 122·20 106·60 121·20	114·150 114·400 113·900	114·275 114·150	114·212	at div. 114 9 45 4 52 37 59 54	at div. 115 9 45 22 52 19 10 0 13	by div. 114 14 50.0 7 25,0	by div. 115 14 51,0 7 25.5	445,106
	16	Neg.	121·20 75·50 118·30 77·50	98·350 96·900 97·900	97·625 97·400	97·512	at div. 95 10 8 10 15 4 23 0,5	at div. 100 10 7 38,5 15 57,5 22 25,5	by div. 95 14 50,5 7 25,25	by div. 100 14 47.0 7 23.50	444,371
	17	Pos.	77·50 146·80 81·80 143·80	112·150 114·300 112·800	113·225 113·550	113·387	at div. 110 10 30 25 38 14 45 8	at div. 115 10 30 44 37 52 45 31	by div. 110 14 45,0 7 22,5	by div. 115 14 47.0 7 23.5	443,177
	18	Neg.	143·80 53·40 138·40 57·60	98·600 95·900 98·000	97·250 96·950	97·100	at div. 95 10 53 11 11 0 27,5 8 7	at div. 100 10 52 55 11 0 44,5 7 49,5	by div. 95 14 56,0 7 28,00	by div. 100 14 54.5 7 27,25	447,685
	19	Pos.	57·60 165·10 63·50 160·60	111·350 114·300 112·050	112·825 113·175	113·000	at div. 110 11 15 36 23 14 30 23,5	at div. 115 11 15 49 23 0 30 38	by div. 110 14 47.5 7 23,75	by div. 115 14 49.0 7 24,50	444,200
T = 44·47 B = 30·330	20	Neg.	160·60 35·80 154·00 41·40	98·200 94·900 97·700	96·550 96·300	96·425	at div. 95 11 38 10 45 37 53 11	at div. 100 11 37 59 45 49 52 58,5	by div. 95 15 1,0 7 30.50	by div. 100 14 59.5 7 29,75	450,286
Jan. 29 T = 43·23 B = 30·214	21	Pos.	106·60 123·70 107·60 122·70	115·150 115·650 115·150	115·400 115·400	115·400	at div. 115 11 5 42,5 13 28 20 45,5	at div. 116 11 6 0 13 10 21 5	by div. 115 15 3,0 7 31,5	by div. 116 15 5,0 7 32,5	451,900
	22	Neg.	122·70 76·10 119·30 78·30	99·400 97·700 98·800	98·550 98·250	98·400	at div. 95 11 29 19 36 8 44 27	at div. 100 11 28 47,5 36 42 43 51	by div. 95 15 8,0 7 34,00	by div. 100 15 3,5 7 31,75	452,470
	23	Pos.	78·30 147·20 82·10 143·30	112·750 114·650 112·700	113·700 113·675	113·687	at div. 110 11 51 44 59 42 0 6 37	at div. 115 11 52 5 59 20,5 0 7 0,5	by div. 110 14 53.0 7 26,50	by div. 115 14 55.5 7 27,75	447,422
Continued.	24	Neg.	143·30 54·50 137·10 58·90	98·900 95·800 98·000	97·350 96·900	97·125	at div. 95 0 14 48,5 22 6 29 48,5	at div. 100 0 14 32 22 23 29 29,5	by div. 95 15 0,0 7 30,00	by div. 100 14 57,5 7 28,75	449,469

1st Series continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=43·21 B=30·060	25	Pos.	58·90 164·00 64·90 159·40	111·450 114·450 112·150	112·950 113·300	113·125	at div. 110 0 37 18 44 58 52 10,5	at div. 115 0 37 31,5 44 43,5 52 25,5	by div. 110 14 52,5 7 26,25	by div. 115 14 54,0 7 27,00	446,719
Jan. 30 T=43·48 B=30·270	26	Neg.	103·10 84·90 102·10 85·50	94·000 93·500 93·800	93·750 93·650	93·700	at div. 93 10 55 29 11 2 57 11 16	at div. 94 10 55 13 11 3 14 10 58	by div. 93 15 47,0 7 53,5	by div. 94 15 45.0 7 52,5	472,800
	27	Pos.	85·50 136·90 88·20 128·40	111·200 112·550 108·300	111·875 110·425	111·150	at div. 110 11 19 28,5 27 35,5 35 16	at div. 115 11 19 58,5 27 4 35 54	by div. 110 15 47.5 7 53.75	by div. 115 15 55.5 7 57,75	474,670
	28	Neg.	128·40 52·50 123·40 53·50	90·450 87·950 88·450	89·200 88·200	88·700	at div. 85 11 43 42 51 6,5 59 44	at div. 90 11 43 21,5 51 28 59 21,5	by div. 85 16 2.0 8 1,0	by div. 90 16 0,0 8 0,0	480,460
	29	Pos.	53·50 159·00 60·90 155·80	106·250 109·950 108·350	108·100 109·150	108·625	at div. 105 0 7 53 16 36 24 33	at div. 110 0 8 8,5 16 19 24 50,5	by div. 105 16 40.0 8 20,0	by div. 110 16 42,0 8 21,0	500,725
	30	Neg.	155·80 28·80 149·70 34·10	92·300 89·250 91·900	90·775 90·575	90·675	at div. 90 0 33 28 41 40,5 50 9.5	at div. 95 0 33 15,5 41 54 50 55,5	by div. 90 16 41.5 8 20,75	by div. 95 16 40.0 8 20,00	500,649
T=43·71 B=30·260	31	Pos.	34·10 184·00 43·30 177·80	109·050 113·650 110·550	111·350 112·100	111·725	at div. 110 0 58 7,5 missed 1 14 50	at div. 115 0 58 18,5 missed 1 15 2,5	by div. 110 16 42,5 8 21,25	by div. 115 16 44.0 8 22,00	501,509
Feb. 1 T=36·97 B=30·058	32	Neg.	108·90 82·60 109·80 80·80	95·750 96·200 95·300	95·975 95·750	95·862	at div. 95 10 26 34 33 47.5 41 41	at div. 96 10 26 23 33 58,5 41 31	by div. 95 15 7,0 7 33.5	by div. 96 15 8.0 7 34,0	453,931
	33	Pos.	80·80 143·50 85·60 138·70	112·150 114·550 112·150	113·350 113·350	113·350	at div. 110 10 49 34 57 47,5 11 4 55,5	at div. 115 10 49 57.5 57 22 11 5 23	by div. 110 15 21,5 7 40,75	by div. 115 15 25.5 7 42.75	462,090
	34	Neg.	138·70 56·50 132·10 62·50	97·600 94·300 97·300	95·950 95·800	95·875	at div. 95 11 13 15,5 20 51 28 39	at div. 100 11 12 57 21 11 28 17,5	by div. 95 15 23.5 7 41,75	by div. 100 15 20.5 7 40,25	461,488
	35	Pos.	62·50 159·50 70·60 154·60	111·000 115·050 112·600	113·025 113·825	113·425	at div. 110 11 36 22,5 44 14,5 51 25,5	at div. 115 11 36 38 43 58 51 43	by div. 110 15 3.0 7 31,5	by div. 115 15 5.0 7 32,5	452,185
Continued.	36	Neg.	154·60 43·70 147·50 51·00	99·150 95·600 99·250	97·375 97·425	97·400	at div. 95 11 59 31,5 0 6 57,5 14 45,5	at div. 100 11 59 17,5 0 7 12 14 30,5	by div. 95 15 14.0 7 37,0	by div. 100 15 13.0 7 36,5	456,760

1st SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T = 36·97 B = 30·010	37	Pos.	51·00 173·20 59·30 167·80	112·100 116·250 113·550	114·175 114·900	114·537	at div. 110 0 22 14,5 29 58 37 6	at div. 115 0 22 26,5 29 45,5 37 19,5	by div. 110 14 51,5 7 25,75	by div. 115 14 53,0 7 26,50	446,431

2nd SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
Feb. 2 T = 33·67 B = 30·028	38	Pos.	119·40 105·70 117·70 105·90	112·550 111·700 111·800 I then	112·125 111·750 brought	111·937 the	at div. 111 11 26 33 33 36,5 42 6 masses round	at div. 112 11 26 10 34 2 41 40 quickly to the	by div. 111 15 33,0 7 46,5 Negative	by div. 112 15 30,0 7 45,0 side.	465,095
	39	Neg.	82·00 105·10 84·50 104·90	93·550 94·800 94·700 I then	94·175 94·750 brought	94·462 the	at div. 94 11 57 33,5 0 5 19 12 39,5 masses round	at div. 95 11 57 47 0 5 5 12 54 quickly to the	by div. 94 15 6,0 7 33,0 Positive	by div. 95 15 7,0 7 33,5 side.	453,231
	40	Pos.	120·30 106·60 120·00 107·50	113·450 113·300 113·750 I then	113·375 113·525 brought	113·450 the	at div. 113 0 29 24 36 47 44 49 masses round	at div. 114 0 29 2 37 8 44 25 quickly to the	by div. 113 15 25,0 7 42,5 Negative	by div. 114 15 23,0 7 41,5 side.	462,050
T = 33·67 B = 30·060	41	Neg.	86·00 106·80 87·70 106·40	96·400 97·250 97·050	96·825 97·150	96·987	at div. 96 1 0 28 8 29 15 32	at div. 97 1 0 42 8 14 15 48	by div. 96 15 4,0 7 32,0	by div. 97 15 6,0 7 33,0	452,987
Feb. 3 T = 31·35 B = 29·766	42	Neg.	94·00 97·50 93·40 96·80	95·750 95·450 95·100 I then	95·600 95·275 brought	95·437 the	at div. 95 10 31 28 40 10 47 6 masses round	at div. 96 10 32 46 38 57 48 32 quickly to the	by div. 95 15 38,0 7 49,0 Positive	by div. 96 15 46,0 7 53,0 side.	470,748
	43	Pos.	125·00 97·70 123·00 98·80	111·350 110·350 110·900 I then	110·850 110·625 brought	110·737 the	at div. 110 11 2 36 9 47 17 29 masses round	at div. 111 11 2 25 9 58,5 17 16,5 quickly to the	by div. 110 14 53,0 7 26,50 Negative	by div. 111 14 51.5 7 25.75 side.	445,947
	44	Neg.	88·80 97·50 89·10 96·40	93·150 93·300 92·750 I then	93·225 93·025 brought	93·125 the	at div. 93 11 33 8,5 40 56 48 42 masses round	at div. 94 11 33 42 40 23 49 22 quickly to the	by div. 93 15 33,5 7 46,75 Positive	by div. 94 15 40.0 7 50,00 side.	467,156
T = 31.12 B = 29·730	45	Pos.	121·70 97·80 120·20 98·80	109·750 109·000 109·500	109·375 109·250	109·312	at div. 109 0 4 13 11 37 19 10	at div. 110 0 4 1 11 49 18 56	by div. 109 14 57,0 7 28,5	by div. 110 14 55,0 7 27.5	448,188

2nd SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Feb. 5 T=29·97 B=29·700	46	Neg.	91·50 103·90 92·10 103·30	97·700 98·000 97·700 I then	97·850 97·850 brought	97·850 the	at div. 97 10 16 38 24 50 31 40 masses round	at div. 98 10 17 0,5 24 25 32 5,5 quickly to the	by div. 97 15 2,0 7 31,0 Positive	by div. 98 15 5,0 7 32,5 side.	* 452,275
	47	Pos.	124·30 104·90 124·00 105·70	114·600 114·450 114·850 I then	114·525 114·650 brought	114·587 the	at div. 114 10 47 40,5 54 54 11 2 59,5 masses round	at div. 115 10 47 26 55 9 11 2 43 quickly to the	by div. 114 15 19,0 7 39,5 Negative	by div. 115 15 17,0 7 38,5 side.	458,913
	48	Neg.	89·10 103·90 88·00 102·50	96·500 95·950 95·250 I then	96·225 95·600 brought	95·912 the	at div. 95 11 18 0 26 20 33 40 masses round	at div. 96 11 18 19 26 1,5 34 0 quickly to the	by div. 95 15 40,0 7 50,0 Positive	by div. 96 15 41,0 7 50,5 side.	470,456
	49	Pos.	122·60 103·40 121·30 104·00	113·000 112·350 112·650 I then	112·675 112·500 brought	112·587 the	at div. 112 11 50 23 57 50 0 5 49 masses round	at div. 113 11 50 7 58 7 0 5 31,5 quickly to the	by div. 112 15 26,0 7 43,00 Negative	by div. 113 15 24,5 7 42,25 side.	462,560
	50	Neg.	83·00 99·60 81·70 99·70	91·300 90·650 90·700 I then	90·975 90·675 brought	90·825 the	at div. 90 0 20 52,5 28 55 36 27,5 masses round	at div. 91 0 21 10 28 38 36 45 quickly to the	by div. 90 15 35,0 7 47,5 Positive	by div. 91 15 35,0 7 47,5 side.	467,500
T=30·13 B=29·700	51	Pos.	121·30 103·40 122·30 105·70	112·350 112·850 114·000	112·600 113·425	113·012	at div. 113 0 53 6,5 1 2 1 10 54	at div. 114 0 52 48 1 2 17 10 34,5	by div. 113 17 47,5 8 53,75	by div. 114 17 46,5 8 53,25	533,744
Feb. 6 T=30·40 B=29·650	52	Pos.	124·80 107·70 124·00 108·90	116·250 115·850 116·450 I then	116·050 116·150 brought	116·100 the	at div. 116 10 7 23,5 15 20 23 17,5 masses round	at div. 117 10 7 6 15 39 22 57 quickly to the	by div. 116 15 54,0 7 57,0 Negative	by div. 117 15 51,0 7 55,5 side.	476,850
	53	Neg.	87·80 107·70 88·50 106·30	97·750 98·100 97·400 I then	97·925 97·750 brought	97·837 the	at div. 97 10 38 54,5 47 23 55 2,5 masses round	at div. 98 10 39 10 47 7 55 20 quickly to the	by div. 97 16 8,0 8 4,0 Positive	by div. 98 16 10,0 8 5,0 side.	484,837
	54	Pos.	125·70 107·10 124·50 107·10	116·400 115·800 115·800 I then	116·100 115·800 brought	115·950 the	at div. 115 11 11 55 19 17 27 41 masses round	at div. 116 11 11 38 19 35 27 23 quickly to the	by div. 115 15 46,0 7 53,0 Negative	by div. 116 15 45,0 7 52,5 side.	472,525
Continued.	55	Neg.	86·00 105·70 87·30 103·80	95·850 96·500 95·550 I then	96·175 96·025 brought	96·100 the	at div. 96 11 43 46,5 52 3 0 0 23,5 masses round	at div. 97 11 44 2,5 51 45,5 0 0 43 quickly to the	by div. 96 16 37,0 8 18,50 Positive	by div. 97 16 40,5 8 20,25 side.	498,675

2nd Series continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	56	Pos.	126·10 103·70 126·00 106·50	114·900 114·850 116·250 I then	114·875 115 550 brought	115·312 the	at div. 115 0 16 47 25 6 33 33 masses round	at div. 116 0 16 33 25 20,5 33 17 quickly to the	by div. 115 16 46,0 8 23,0 Negative	by div. 116 16 44,0 8 22,0 side.	502,688
T = 30·75 B = 29·634	57	Neg.	88·60 107·20 91·70 107·80	97·900 99·450 99·750	98·675 99·600	99·137	at div. 99 0 50 49 58 49 1 6 39,5	at div. 100 0 51 6 58 30 1 6 59	by div. 99 15 50,5 7 55,25	by div. 100 15 53,0 7 56,50	475,421
Feb. 8 T = 30·5 B =	58	Pos.	121·30 109·50 120·30 109·30	115·400 114·900 114·800 I then	115·150 114·850 brought	115·000 the	at div. 115 11 4 17 11 54 19 34 masses round	at div. 116 11 3 53 12 22 19 7 quickly to the	by div. 115 15 17,0 7 38,5 Negative	by div. 116 15 14,0 7 37,0 side.	458,500
	59	Neg.	83·80 107·70 83·80 104·90	95·750 95·750 94·350 I then	95·750 95·050 brought	95·400 the	at div. 95 11 35 32,5 43 52,5 51 58,5 masses round	at div. 96 11 35 45 43 39,5 52 13 quickly to the	by div. 95 16 26,0 8 13,0 Positive	by div. 96 16 28,0 8 14,0 side.	493,400
T = 30·5 B =	60	Pos.	123·00 106·30 123·20 108·90	114·650 114·750 116·050	114·700 115·400	115·050	at div. 115 0 8 45 17 32 26 21	at div. 116 0 8 26 17 52 25 58	by div. 115 17 36,0 8 48,0	by div. 116 17 32,0 8 46,0	527,900

3rd Series.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
Feb. 20 T = 48·61 B = 29·864	61	Pos.	100·00 118·30 101·10 118·10	109·150 109·700 109·600	109·425 109·650	109·537	at div. 109 2 32 57 41 7 48 43	at div. 110 2 33 13,5 40 49 49 1	by div. 109 15 46,0 7 53,00	by div. 110 15 47,5 7 53,75	473,403
	62	Neg.	118·10 64·50 115·40 66·00	91·300 89·950 90·700	90·625 90·325	90·475	at div. 90 2 57 33 3 5 36 13 51	at div. 91 2 57 28 3 5 42 13 45	by div. 90 16 18,0 8 9,0	by div. 91 16 17,0 8 8,5	488,763
	63	Pos.	66·00 153·00 71·80 150·60	109·500 112·400 111·200	110·950 111·800	111·375	at div. 110 3 22 26,5 30 58,5 39 9,5	at div. 115 3 22 45 30 38,5 39 30	by div. 110 16 43,0 8 21,5	by div. 115 16 45,0 8 22,5	501,775
	64	Neg.	150·60 37·50 145·50 43·60	94·050 91·500 94·550	92·775 93·025	92·900	at div. 90 3 48 4,5 56 10,5 4 4 53,5	at div. 95 3 47 51 56 25 4 4 38	by div. 90 16 49,0 8 24,5	by div. 95 16 47,0 8 23,5	503,920
T = 49·00 B = 29·900	65	Pos.	43·60 179·60 52·50 172·90	111·600 116·050 112·700	113·825 114·375	114·100	at div. 110 4 13 12 21 53 29 54	at div. 115 4 13 24 21 41 30 7,5	by div. 110 16 42,0 8 21,00	by div. 115 16 43,5 8 21,75	501,615

3rd Series continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Feb. 21 T =49·05 B=30·214	66	Pos.	108·90 missed. 108·70 109·20	108·950		108·950	The are too	small for	observing	tha time.	
	67	Neg.	109·20 74·70 106·20 74·90	91·950 90·450 90·550	91·200 90·500	90·850	at div. 90 10 18 43 26 0 33 49	at div. 91 10 18 34,5 26 9,5 33 39,5	by div. 90 15 6,0 7 33,0	by div. 91 15 5,0 7 32,5	452,575
	68	Pos.	74·90 138·70 77·90 137·00	106·800 108·300 107·450	107·550 107·875	107·687	at div. 105 10 41 41 49 50 57 5	at div. 110 10 42 4,5 49 25,5 57 30,5	by div. 105 15 24,0 7 42,0	by div. 110 15 26,0 7 43,0	462,537
	69	Neg.	137·00 44·90 134·40 47·90	90·950 89·650 91·150	90·300 90·400	90·350	at div. 90 11 5 24,5 13 11 21 13	at div. 95 11 5 8 13 28 20 55,5	by div. 90 15 48,5 7 54,25	by div. 95 15 47,5 7 53,75	474,215
	70	Pos.	47·90 169·40 55·40 167·20	108·650 112·400 111·300	110·525 111·850	111·187	at div. 110 11 29 32 37 42,5 45 43,5	at div. 115 11 29 45 37 29 45 58	by div. 110 16 11,5 8 5,75	by div. 115 16 13,0 8 6,50	485,928
	71	Neg.	167·20 23·00 161·80 28·80	95·100 92·400 95·300	93·750 93·850	93·800	at div. 90 11 54 22,5 0 2 18 10 51	at div. 95 11 54 11,5 0 2 29,5 10 39	by div. 90 16 28,5 8 14,25	by div. 95 16 27,5 8 13,75	493,870
	72	Pos.	28·80 194·40 37·50 187·80	111·650 115·950 112·650	113·800 114·300	114·050	at div. 110 0 19 0 27 28,5 35 28	at div. 115 0 19 9,5 27 18,5 35 38,5	by div. 110 16 28,0 8 14,0	by div. 115 16 29,0 8 14,5	494,405
T =49·40 B=30·230	73	Neg.	187·80 6·60 179·50 15·10	97·200 93·050 97·300	95·125 95·175	95·150	at div. 95 0 44 5,5 52 21 1 0 39,5	at div. 100 0 43 56 52 30 1 0 29	by div. 95 16 34,0 8 17,0	by div. 100 16 33,0 8 16,5	496,985
Feb. 22 T =48·11 B=30·390	74	Pos.	117·40 118·20	117·800		117·800	Tha are too	small for	observing	the time.	
	75	Neg.	118·20 83·70 116·50 84·30	100·950 100·100 100·400	100·525 100·250	100·387	at div. 100 9 54 48 10 2 18 10 2	at div. 101 9 54 39 10 2 27 9 52	by div. 100 15 14,0 7 37,0	by div. 101 15 13,0 7 36,5	456,807
	76	Pos.	84·30 147·00 85·60 143·80	115·650 116·300 114·700	115·975 115·500	115·737	at div. 115 10 18 0 25 43 33 14	at div. 116 10 18 4,5 25 38 33 19	by div. 115 15 14,0 7 37,00	by div. 116 15 14,5 7 37,25	457,184
Continued.	77	Nag.	143·80 53·10 138·90 54·40	98·450 96·000 96·650	97·225 96·325	96·775	at div. 95 10 41 14 48 37 56 20	at div. 100 10 40 58 48 54 56 3	by div. 95 15 6,0 7 33,0	by div. 100 15 5,0 7 32,5	452,823

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	78	Pos.	54·40 166·70 57·80 162·00	110·550 112·250 109·900	111·400 111·075	111·237	at div. 110 11 4 3,5 11 41,5 19 9,5	at div. 115 11 4 16,5 11 28,5 19 23	by div. 110 15 6,0 7 33,00	by div. 115 15 6,5 7 33,25	* 453,062
	79	Neg.	162·00 28·00 155·80 31·50	95·000 91·900 93·650	93·450 92·775	93·112	at div. 90 11 26 59,5 34 17,5 42 0	at div. 95 11 26 49 34 28,5 41 49	by div. 90 15 0,5 7 30,25	by div. 95 15 0,0 7 30,00	450,094
	80	Pos.	31·50 183·10 37·40 177·50	107·300 110·250 107·450	108·775 108·850	108·812	at div. 105 11 49 29,5 57 17,5 0 4 35	at div. 110 11 49 39 57 8 0 4 45,5	by div. 105 15 5,5 7 32,75	by div. 105 15 6,5 7 33,25	453,131
	81	Neg.	177·50 9·50 170·00 15·80	93·500 89·750 92·900	91·625 91·325	91·475	at div. 90 0 12 30 19 53 27 40	at div. 95 0 12 21 20 3 27 30,5	by div. 90 15 10,0 7 35,00	by div. 95 15 9,5 7 34,75	454,926
	82	Pos.	15·80 198·80 25·10 193·40	107·300 111·950 109·250	109·625 110·600	110·112	at div. 105 0 35 17 43 19,5 50 43,5	at div. 110 0 35 25 43 11 50 52,5	by div. 105 15 26,5 7 43,25	by div. 110 15 27,5 7 43,75	463,762
			After an to still	interval compare io the	of about with CAVENDISH'S Positive	an hour position.	I made the mode of	following observations, proceeding:	the masses	in order being	
	83	Pos.	163·50 57·40 157·90	110·450 107·650	109·050		at div. 105 2 19 27 27 9,5	at div. 110 2 19 12 27 25			
T = 48·25 B = 30·376	84	Neg.	157·90 26·80 152·00 31·70	92·350 89·400 91·850	90·875 90·625	90·750	at div. 90 2 35 47,5 43 40,5 51 50,5	at div. 95 2 35 35,5 43 53 51 37,5	by div. 90 16 3,0 8 1,5	by div. 95 16 2 8 1,0	481,425
Feb. 23 T = 47·30 B = 30·364	85	Neg.	93·00 92·70 92·70 92·20			92·450	The are too	small for	observing	the time.	
	86	Pos.	92·20 125·30 93·80 123·90	108·750 109·550 108·350	109·150 108·950	109·050	at div. 109 10 2 5 9 39 17 9	at div. 110 10 2 14 9 30 17 18,5	by div. 109 15 4,0 7 32,00	by div. 110 15 4,5 7 32,25	452,002
	87	Neg.	123·90 62·80 120·60 65·60	93·350 91·700 93·100	92·525 92·400	92·462	at div. 90 10 25 21 32 31 40 27,5	at div. 95 10 24 57 32 56 40 1	by div. 90 15 6,5 7 33,25	by div. 95 15 4,0 7 32,00	452,635
Continued.	88	Pos.	65·60 149·80 70·30 146·50	107·700 110·050 108·400	108·875 109·225	109·050	at div. 105 10 47 54,5 55 53 11 2 54	at div. 110 10 48 12 55 35 11 3 13	by div. 105 14 59,5 7 29,75	by div. 110 15 1,0 7 30,50	450,357

3rd Series continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	89	Neg.	146·50 41·60 140·90 45·90	94·050 91·250 93·400	92·650 92·325	92·487	at div. 90 11 11 1,5 18 21,5 26 7	at div. 95 11 10 48 18 36 25 51,5	by div. 90 15 5,5 7 32,75	by div. 95 15 3,5 7 31,75	* 452,253
	90	Pos.	45·90 168·80 52·80 164·50	107·350 110·800 108·650	109·075 109·725	109·400	at div. 105 11 33 39 41 34,5 48 44,5	at div. 110 11 33 51 41 22 48 58	by div. 105 15 5,5 7 32,75	by div. 110 15 7,0 7 33,50	453,410
	91	Neg.	164·50 25·60 157·60 30·80	95·050 91·600 94·200	93·325 92·900	93·112	at div. 90 11 56 53 0 4 16,5 12 12	at div. 95 11 56 42,5 0 4 27,5 12 0,5	by div. 90 15 19,0 7 39,5	by div. 95 15 18,0 7 39,0	459,189
T=47·40 B=30·350	92	Pos.	30·80 187·20 39·00 183·00	109·000 113·100 111·000	111·050 112·050	111·550	at div. 110 0 19 55,5 24 53 35 36,5	at div. 115 0 20 5 24 43,5 35 47	by div. 110 15 41,0 7 50,5	by div. 115 15 42,0 7 51,0	470,655
Feb. 24 T=45·37 B=30·340	93	Pos.	113·40 113·70			113·550	The are too	small for	observing	the time.	
	94	Neg.	113·70 79·90 112·70 81·40	96·800 96·300 97·050	96·550 96·675	96·662	at div. 96 10 33 6 40 35 48 23,5	at div. 97 10 32 57 40 44 48 14	by div. 96 15 17,5 7 38,75	by div. 97 15 17,0 7 38,50	458,585
	95	Pos.	81·40 143·50 85·00 139·40	112·450 114·250 112·200	113·350 113·225	113·287	at div. 113 10 56 24 11 4 4 11 42,5	at div. 114 10 56 28,5 11 3 59 11 47,5	by div. 113 15 18,5 7 39,25	by div. 114 15 19,0 7 39,50	459,322
	96	Neg.	139·40 54·50 133·60 58·40	96·950 94·050 96·000	95·500 95·025	95·262	at div. 95 11 19 36,5 27 12,5 34 49	at div. 100 11 19 19 27 31 34 29,5	by div. 95 15 12,5 7 36,25	by div. 100 15 10,5 7 35,25	456,198
	97	Pos.	58·40 159·50 63·70 153·80	108·950 111·600 108·750	110·275 110·175	110·225	at div. 110 11 42 43 50 22,5 57 52	at div. 115 11 42 58 50 10 58 8	by div. 110 15 9,0 7 34,5	by div. 115 15 10,0 7 35,0	454,522
	98	Neg.	153·80 35·40 146·30 40·40	94·600 90·850 93·350	92·725 92·100	92·412	at div. 90 0 5 43 13 3 20 44,5	at div. 95 0 5 31 13 16 20 31	by div. 90 15 1,5 7 30,75	by div. 95 15 0,0 7 30,00	450,388
			After an	interval having	of about remained	4 hours in the	I continued the Negative posi	experiments as tion during that	follow; the period.	masses	
Continued.	99	Neg.	81·10 104·00 82·00	92·550 93·000	92·775	92·775	at div. 92 4 28 46 36 44	at div. 93 4 28 58,5 36 31			

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean	2nd Mean	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T = 47·23 B = 30·332	100	Pos.	82·00 133·10 84·70 132·90	108·530 109·900 108·800	109·225 109·350	109·287	at div. 109 4 44 32 52 4 59 32,5	at div. 110 4 44 38 51 58 59 39	by div. 109 15 0,3 7 30,25	by div. 110 15 1,0 7 30,50	450,322
Feb. 23 T = 43·77 B = 30·340	101	Pos.	110·40 110·40			110·400	The arc too small for observing the time.				
	102	Neg.	110·40 79·00 108·80 80·60	94·700 93·900 94·700	94·300 94·300	94·300	at div. 94 9 58 20 10 6 40 13 12	at div. 95 9 38 10 10 6 50 13 1	by div. 94 14 52,0 7 26,0	by div. 95 14 51,0 7 25,5	443,850
	103	Pos.	80·60 138·60 84·20 136·20	109·600 111·400 110·200	110·500 110·800	110·650	at div. 110 10 21 0 28 30 35 47	at div. 111 10 21 5 28 25 35 52,5	by div. 110 14 47,0 7 23,30	by div. 111 14 47,5 7 23,75	443,662
	104	Neg.	136·20 53·30 131·40 58·80	95·750 93·350 95·100	94·530 94·225	94·387	at div. 90 10 43 52 50 49,5 58 50,5	at div. 95 10 43 34 31 8,3 38 30,5	by div. 90 14 58,5 7 29,25	by div. 93 14 56,3 7 28,23	448,373
			Here I was interrupted for about ¾ of an hour; at the end of which interval I resumed the observations: the masses still remaining Negative. The four experiments exhibit an increase in the time, and a variation in the resting points.								
	105	Neg.	67·90 115·40 69·50	91·630 92·430	92·050	92·050	at div. 92 11 51 17 58 33	at div. 93 11 51 23 58 46,3			
	106	Pos.	69·50 146·30 72·70 143·40	107·900 109·500 109·050	108·700 109·275	108·987	at div. 105 0 6 37,5 14 50 22 2,5	at div. 110 0 6 57 14 30,3 22 23	by div. 105 15 25,0 7 42,5	by div. 110 15 26,0 7 43,0	462,899
	107	Neg.	145·40 38·70 139·70 42·50	92·030 89·200 91·100	90·625 90·150	90·387	at div. 90 0 30 35,5 38 26 46 32,5	at div. 95 0 30 21 38 41 46 16,3	by div. 90 15 57,0 7 38,50	by div. 95 15 33,3 7 37,75	478,442
	108	Pos.	42·50 173·30 30·10 168·10	107·900 111·700 109·100	109·800 110·400	110·100	at div. 110 0 54 52,5 1 3 3 11 17,5	at div. 115 0 53 4,5 1 2 50 11 31	by div. 110 16 25,0 8 12,50	by div. 115 16 26,5 8 13,25	492,515
			After an interval of 2½ hours I continued the observations as follow.								
	109	Pos.	93·50 133·70 98·00 134·20	113·600 116·850 116·100	116·225 116·475	116·350	at div. 116 3 40 37 48 40,5 56 37,5	at div. 117 3 40 44,5 48 32 56 46	by div. 116 16 0,5 8 0,25	by div. 117 16 1,3 8 0,75	480,425
T = 44·00 B = 30·270	110	Neg.	134·20 60·90 129·30 61·90	97·330 95·200 95·700	96·375 93·450	93·912	at div. 95 4 5 12 13 10 21 27,5	at div. 100 4 4 50,5 13 32,3 21 3,5	by div. 95 16 15,5 8 7,73	by div. 100 16 13,0 8 6,50	487,522

3rd Series continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean	3rd Mean, or Resting Point	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Feb 26 T=44·50 B=29·880	111	Neg.	90·70 88·30			89·500	The arc too	small for	observing	the time.	*
	112	Pos.	88·30 126·90 91·10 126·90	107·600 109·000 109·000	108·300 109·000	108·650	at div. 108 9 48 26 56 37 10 4 26	at div. 109 9 48 34 56 29 10 4 35	by div. 108 16 0,0 8 0,0	by div. 109 16 1,0 8 0,5	480,325
	113	Neg.	126·90 54·80 119·00 56·90	90·850 86·900 87·950	88·875 87·425	88·150	at div. 85 10 13 42,5 21 24 30 11	at div. 90 10 13 20 21 48 29 45	by div. 85 16 28,5 8 14,25	by div. 90 16 25,0 8 12,50	493,148
	114	Pos.	56·90 155·40 63·80 152·00	106·150 109·600 107·900	107·875 108·750	108·312	at div. 105 10 38 35 47 24 55 26,5	at div. 110 10 38 51,5 47 6 55 45	by d.v. 105 16 51,5 8 25,75	by div. 110 16 53,5 8 26,75	506,412
	115	Neg.	152·00 30·60 146·80 36·00	91·300 88·700 91·400	90·000 90·050	90·025	at div. 85 11 4 33 12 24 21 20	at div. 90 11 4 19,5 12 38 21 5,5	by div. 85 16 47,0 8 23,5	by div. 90 16 46,0 8 23,0	502,998
T=44·78 B=29·820	116	Pos.	36·00 182·30 45·50 176·80	109·150 113·900 111·150	111·525 112·525	112·025	at div. 110 11 29 36,5 38 9 46 23	at div. 115 11 29 48 37 57 46 35,5	by div. 110 16 46,5 8 23,25	by div. 115 16 47,5 8 23,75	503,475
Feb. 26 T=45·00 B=29·820	117	Neg.	117·70 70·80 114·80 73·40	94·250 92·800 94·100	93·525 93·450	93·487	at div. 93 1 19 43,5 28 11 36 52,5	at div. 94 1 19 36,5 28 19 36 44,5	by div. 93 17 9,0 8 34,5	by div. 94 17 8,0 8 34,0	514,257
	118	Pos.	73·40 153·90 79·30 150·40	113·650 116·600 114·850	115·125 115·725	115·425	at div. 115 1 45 41,5 54 14,5 2 2 41	at div. 120 1 46 2 53 52,5 2 3 4	by div. 115 16 59,5 8 29,75	by div. 120 17 2,0 8 31,00	509,856
	119	Neg.	150·40 44·40 144·60 50·80	97·400 94·500 97·700	95·950 96·100	96·025	at div. 95 2 11 31,5 19 55 28 31,5	at div. 100 2 11 16,5 20 11 28 14	by div. 95 17 0,0 8 30,00	by div. 100 16 57,5 8 28,75	509,744
	120	Pos.	50·80 179·60 59·50 173·20	115·200 119·550 116·350	117·375 117·950	117·662	at div. 115 2 37 2,5 45 38,5 53 51	at div. 120 2 37 15 45 25 54 5,5	by div. 115 16 48,5 8 24,25	by div. 120 16 50,5 8 25,25	504,782
			After an	interval	of about	an hour	I continued	the observa	tions as	follow.	
	121	Pos.	158·10 85·80 154·30	121·950 120·050	121·000	121·000	at div. 120 3 53 10 4 1 29	at div. 122 3 53 1 4 1 38,5			
T=44·78 B=29·778	122	Neg.	154·30 49·70 148·00 55·40	102·000 98·850 101·700	100·425 100·275	100·350	at div. 100 4 10 16,5 18 43,5 27 13,5	at div. 105 4 10 1 19 0 26 56	by div. 100 16 57,0 8 28,5	by div. 105 16 55,0 8 27,5	508,430

3rd SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Feb. 27 T=44·23 B=29·774	123	Neg.	93·90 93·80			93·850	The arc too	small for	observing	the time.	*
	124	Pos.	93·80 126·10 94·90 125·20	109·950 110·500 110·050	110·225 110·275	110·250	at div. 110 10 3 59,5 11 30,5 18 54,5	at div. 111 10 4 8,5 11 21 19 4	by div. 110 14 55,0 7 27,50	by div. 111 14 55,5 7 27,75	447,562
	125	Neg.	125·20 63·70 122·10 66·00	94·450 92·900 94·050	93·675 93·475	93·575	at div. 92 11 26 53 34 11 41 58	at div. 94 11 26 43,5 34 21 41 48	by div. 92 15 5,0 7 32,50	by div. 94 15 4,5 7 32,25	452,303
	126	Pos.	66·00 151·70 69·30 148·70	108·850 110·500 109·000	109·675 109·750	109·712	at div. 105 10 49 19 57 18,5 11 4 16	at div. 110 10 49 36 57 1 11 4 34	by div. 105 14 57,0 7 28,5	by div. 110 14 58,0 7 29,0	448,971
	127	Neg.	148·70 39·50 144·20 42·80	94·100 91·850 93·500	92·975 92·675	92·825	at div. 90 11 12 19 19 34 27 17	at div. 95 11 12 5,5 19 48 27 3	by div. 90 14 58,0 7 29,00	by div. 95 14 57,5 7 28,75	448,859
T=44·31 B=29·810	128	Pos.	42·80 172·10 47·00 167·90	107·450 109·550 107·450	108·500 108·500	108·500	at div. 105 11 34 38,5 42 22 49 34,5	at div. 110 11 34 50 42 10 49 46,5	by div. 105 14 56,0 7 28,00	by div. 110 14 56,5 7 28,25	448,175
Feb. 28 T=42·50 B=29·884	129	Pos.	120·30 120·70			120·500	The arc too	small for	observing	the time.	
	130	Neg.	120·70 87·30 118·60 88·80	104·000 102·950 103·700	103·475 103·325	103·400	at div. 103 10 33 54,5 41 22 49 3,5	at div. 104 10 33 46 41 31 48 54	by div. 103 15 9,0 7 34,5	by div. 104 15 8,0 7 34,0	454,300
	131	Pos.	88·80 149·50 93·10 145·90	119·150 121·300 119·500	120·225 120·400	120·312	at div. 120 10 56 56 11 4 36 12 8,5	at div. 121 10 57 1 11 4 30,5 12 14	by div. 120 15 12,5 7 36,25	by div. 121 15 13,0 7 36,50	456,328
	132	Neg.	145·90 63·20 140·70 66·90	104·550 101·950 103·800	103·250 102·875	103·062	at div. 100 11 20 11 27 24 35 22,5	at div. 105 11 19 53,5 27 42,5 35 3	by div. 100 15 11,5 7 35,75	by div. 105 15 9,5 7 34,75	455,138
	133	Pos.	66·90 168·50 72·60 162·80	117·700 120·550 117·700	119·125 119·125	119·125	at div. 115 11 42 48 50 46 57 58	at div. 120 11 43 2,5 50 31 58 14	by div. 115 15 10,0 7 35,00	by div. 120 15 11,5 7 35,75	455,619
T=42·47 B=29·850	134	Neg.	162·80 44·10 156·00 48·50	103·450 100·050 102·250	101·750 101·150	101·450	at div. 100 0 5 59 missed 21 6,5	at div. 105 0 5 46,5 missed 20 53	by div. 100 15 7,5 7 33,75	by div. 105 15 6,5 7 33,25	453,605

4th Series.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
March 1 T = 42·44 B = 29·646	155	Pos.	107·80 125·50 110·70 124·80	116·650 118·100 117·750	117·575 117·925	117·650	at div. 117 9 45 5 53 3 10 0 2	at div. 118 9 45 25 52 43 10 0 23	by div. 117 14 57,0 7 28,5	by div. 118 15 0,0 7 50,0	* 449,475
	156	Neg.	124·80 80·70 121·10 83·40	102·750 100·900 102·250	101·825 101·575	101·700	at div. 101 10 8 36 16 3 23 50	at div. 102 10 8 29 16 10,5 25 42	by div. 101 15 14,0 7 57,0	by div. 102 15 13,0 7 36,5	456,650
	157	Pos.	85·40 148·80 87·20 144·50	116·100 118·000 115·850	117·050 116·925	116·987	at div. 115 10 51 29 39 16 46 54,5	at div. 120 10 31 51 58 55 47 0	by div. 115 15 5,5 7 32,75	by div. 120 15 9,0 7 34,50	453,445
	138	Neg.	144·50 58·80 138·30 64·00	101·650 98·550 101·150	100·100 99·850	99·975	at div. 95 10 54 48,5 11 1 54,5 10 11,5	at div. 100 10 54 51 11 2 13 9 52	by div. 95 15 25,0 7 41,5	by div. 100 15 21,0 7 40,5	460,505
March 2 T = 42·55 B = 29·680	139	Pos.	113·70 114·50			114·000	The arc too	small for	observing	the time.	
	140	Neg.	114·30 85·85 112·20 87·50	100·075 99·025 99·850	99·550 99·457	99·493	at div. 99 10 55 10 missed. 47 14,5	at div. 100 10 33 0 missed. 47 3	by div. 99 14 4,5 7 2,25	by div. 100 14 3,0 7 1,50	421,880
	141	Pos.	87·50 138·20 90·00 155·10	112·850 114·100 112·550	115·475 115·525	115·400	at div. 112 10 54 24 11 1 41 8 28	at div. 114 10 54 34,5 11 1 50 8 40	by div. 112 14 4,0 7 2,00	by div. 114 14 5,5 7 2,75	422,525
	142	Neg.	155·10 65·50 129·50 65·50	99·300 96·500 97·500	97·900 97·000	97·450	at div. 96 11 15 57 22 46,5 29 57,5	at div. 98 11 15 49,5 22 55 29 50	by div. 96 14 0,5 7 0,25	by div. 98 14 0,5 7 0,25	420,250
	143	Pos.	65·50 152·40 70·00 147·85	108·950 111·200 108·925	110·075 110·062	110·068	at div. 110 11 37 11 44 18 51 27	at div. 115 11 37 27 44 1,5 51 45	by div. 110 14 16,0 7 8,0	by div. 115 14 18,0 7 9,0	428,014
	144	Neg.	147·85 47·00 142·10 54·10	97·425 94·550 98·100	95·987 96·525	96·156	at div. 95 11 58 51 0 5 58,5 13 23,5	at div. 100 11 58 37 0 6 13 13 7,5	by div. 14 32,5 7 16,25	by div. 14 30,5 7 15,25	456,019
	145	Pos.	54·10 170·90 64·70 168·60	112·500 117·800 116·650	115·150 117·225	116·187	at div. 115 0 20 50,5 28 26 35 51	at div. 120 0 21 3 28 12 56 5,5	by div. 115 15 0,5 7 30,25	by div. 120 15 2,5 7 51,25	450,487
Continued.	146	Neg.	168·60 45·70 164·70 52·50	106·150 104·200 108·600	105·175 106·400	105·787	at div. 105 0 45 46,5 51 29,5 59 23	at div. 110 0 45 35 51 42 59 9,5	by div. 105 15 56,5 7 48,25	by div. 110 15 34,5 7 47,25	468,093

4th SERIES continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	147	Pos.	52·50 191·50 64·50 181·80	122·000 128·000 123·650	125·000 125·825	125·412	at div. 125 1 7 25 15 7 25 8,5	at div. 130 1 7 34 14 55 25 22	by div. 125 15 45,5 7 52,75	by div. 130 15 48,0 7 54,00	* 472,855
T = 42·75 B = 29·590	148	Neg.	181·80 37·90 170·30 46·40	110·350 104·100 108·350	107·225 106·225	106·725	at div. 105 1 31 17 39 15 47 26	at div. 110 1 31 6 59 26,5 47 13	by div. 105 16 9,0 8 4,5	by div. 110 16 7,0 8 5,5	484,155
March 5 T = 43·41 B = 29·356	149	Pos.	111·20 130·60 115·35 130·50	120·900 121·975 121·825	121·437 121·900	121·668	at div. 121 10 5 52 12 20 20 5	at div. 122 10 4 8,5 12 2 20 24,5	by div. 121 16 15,0 8 6,5	by div. 122 16 16,0 8 8,0	487,502
	150	Neg.	130·30 78·90 127·90 82·80	104·600 103·400 105·350	104·000 104·375	104·187	at div. 104 10 29 0 37 16 45 40	at div. 106 10 28 48 57 29 45 25,5	by div. 104 16 40,0 8 20,00	by div. 106 16 37,5 8 18,75	499,883
	151	Pos.	82·80 161·60 89·50 157·10	122·200 125·550 123·300	125·875 124·425	124·150	at div. 120 10 55 56 11 2 35 10 11,5	at div. 125 10 54 16 11 2 14 10 55	by div. 120 16 15,5 8 7,75	by div. 125 16 19,0 8 9,50	489,202
	152	Neg.	157·10 58·15 149·70 64·80	107·615 103·915 107·250	105·775 105·587	105·681	at div. 105 11 18 55,5 27 5 35 20,5	at div. 110 11 18 59,5 27 22 35 2	by div. 105 16 25,0 8 12,50	by div. 110 16 22,5 8 11,25	492,330
	153	Pos.	64·80 178·50 74·00 170·10	121·650 126·250 122·050	123·950 124·150	124·050	at div. 120 11 43 32,5 52 0 59 51,5	at div. 125 11 43 46,5 51 45 0 0 8	by div. 120 16 19,0 8 9,50	by div. 125 16 21,5 8 10,75	490,512
T = 43·73 B = 29·588	154	Neg.	170·10 45·60 159·40 54·30	107·850 102·500 106·850	105·175 104·675	104·925	at div. 100 0 8 34 16 25,5 25 10	at div. 105 0 8 21,5 16 39,5 24 54,5	by div. 100 16 56,0 8 18,0	by div. 105 16 55,0 8 16,5	496,523
March 4 T = 43·55 B = 29·928	155	Pos.	111·40 122·40 111·60 121·80	116·900 117·000 116·700	116·950 116·850	116·900	at div. 116 10 17 59 25 19 31 38	at div. 117 10 18 5 24 55 32 5	by div. 116 13 59,0 6 59,5	by div. 117 14 2,0 7 1,0	420,850
	156	Neg.	121·80 84·34 119·26 87·50	103·070 101·800 103·580	102·435 102·590	102·512	at div. 102 10 39 25 46 28 55 43	at div. 105 10 59 17 46 36 55 54	by div. 102 14 18,0 7 9,0	by div. 105 14 17,0 7 8,5	428,744
	157	Pos.	87·50 144·50 90·50 141·40	116·000 117·400 115·850	116·700 116·625	116·662	at div. 116 11 0 51,5 7 55 14 45	at div. 117 11 0 56 7 48 14 50	by div. 116 15 53,5 6 56,75	by div. 117 13 54,0 6 57,0	416,915
Continued.	158	Neg.	141·40 64·20 135·50 66·96	102·800 99·850 101·230	101·325 100·540	100·932	at div. 100 11 22 1 28 55 35 58,5	at div. 105 11 21 44 29 14 35 59	by div. 100 13 57,5 6 58,75	by div. 105 13 55,0 6 57,5	418,527

4th SERIES continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	159	Pos.	66·96 158·30 70·80 153·40	112·630 114·550 112·100	113·590 113·325	113·457	at div. 110 11 42 56 50 14,5 56 54	at div. 115 11 43 11 49 59,5 57 10	by div. 110 13 58,0 6 59,0	by div. 115 13 59,0 6 59,5	s 419·346
T=43·57 B=29·916	160	Neg.	153·40 46·50 146·74 50·80	99·950 96·620 98·770	98·285 97·695	97·990	at div. 95 0 4 17,5 11 2 18 17,5	at div. 100 0 4 5 11 15,5 18 3	by div. 95 14 0,0 7 0,0	by div. 100 13 58,0 6 59,0	419·402
			The masses were then brought round to the Positive side, and thus left for about 2½ hours, during which period no part of the apparatus was touched. The four subsequent experiments on that day exhibit here also a singular increase in the time, and a considerable difference in the position of the resting point, for which I cannot satisfactorily account.								
	161	Pos.	103·10 132·32 107·54 132·30	117·710 119·930 119·920	118·820 119·925	119·372	at div. 118 2 59 18,5 3 7 45 15 3,5	at div. 120 2 59 40 3 7 20 15 29	by div. 118 15 45,0 7 52,5	by div. 120 15 49,0 7 54,5	473·872
	162	Neg.	132·30 74·84 128·88 77·70	103·570 101·860 103·290	102·715 102·575	102·645	at div. 102 3 23 58,5 31 57,5 40 11,5	at div. 104 3 23 48 32 9 39 59	by div. 102 16 13,0 8 6,5	by div. 104 16 11,0 8 5,5	486·178
	163	Pos.	77·70 161·30 86·20 158·00	119·500 123·750 122·100	121·625 122·925	122·275	at div. 120 3 48 29 56 43 4 4 27,5	at div. 125 3 48 47,5 56 22,5 4 4 49	by div. 120 15 58,5 7 59,25	by div. 125 16 1,5 8 0,75	479·932
T=43·93 B=29·870	164	Neg.	158·00 57·90 150·52 64·54	107·950 104·210 107·530	106·080 105·870	105·975	at div. 105 4 13 2 21 5 29 17,5	at div. 110 4 12 46,5 21 22 28 59,5	by div. 105 16 15,5 8 7,75	by div. 110 16 13,0 8 6,50	487·506
March 5 T=43·70 B=29·860	165	Pos.	108·30 123·70 108·86 122·10	116·000 116·280 115·480	116·140 115·880	116·010	at div. 116 9 43 38,5 50 53 58 10	at div. 117 9 43 57 50 34 58 31	by div. 116 14 31,5 7 15,75	by div. 117 14 34,0 7 17,00	435·762
	166	Neg.	122·10 79·60 118·30 80·96	100·850 98·950 99·630	99·900 99·290	99·595	at div. 98 10 5 49 12 36 20 7	at div. 100 10 5 36 12 50 19 52	by div. 98 14 18,0 7 9,0	by div. 100 14 16,0 7 8,0	428·203
	167	Pos.	80·96 143·78 84·80 140·34	112·370 114·290 112·570	113·330 113·430	113·380	at div. 110 10 27 14 34 56,5 41 39,5	at div. 115 10 27 36 34 33 42 5	by div. 110 14 25,5 7 12,75	by div. 115 14 29,0 7 14,50	433·933
	168	Neg.	140·34 58·50 136·00 63·80	99·420 97·250 99·900	98·335 98·575	98·455	at div. 95 10 49 38 56 36 11 4 33,5	at div. 100 10 49 21 56 54 11 4 13,5	by div. 95 14 55,5 7 27,75	by div. 100 14 52,5 7 26,25	446·714
Continued.	169	Pos.	63·80 168·50 74·20 166·70	116·150 121·350 120·450	118·750 120·900	119·825	at div. 115 11 11 57,5 20 2 27 12,5	at div. 120 11 12 12 19 46 27 29	by div. 115 15 15,0 7 37,5	by div. 120 15 17,0 7 38,5	458·465

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
T=44·25 B=29·716	170	Neg.	166·70 47·30 161·60 54·50	107·000 104·450 108·050	105·725 106·250	105·987	at div. 105 11 35 32 missed. 51 23	at div. 110 11 35 19,5 missed. 51 9,5	by div. 105 15 51,0 7 55,5	by div. 110 15 50,0 7 55,0	* 475·401
March 6 T=45·75 B=29·800	171	Neg.	99·00 81·48 98·10 82·00	90·240 89·790 90·050	90·015 89·920	89·967	at div. 89 9 42 26 49 29 57 36	at div. 90 9 42 9 49 46 57 18	by div. 89 15 10,0 7 35,0	by div. 90 15 9,0 7 34,5	454,517
	172	Pos.	82·00 129·90 80·20 127·50	105·950 105·050 103·850	105·500 104·450	104·975	at div. 104 10 5 5 13 3 20 39	at div. 105 10 5 11 12 57 20 45	by div. 104 15 34,0 7 47,0	by div. 105 15 34,0 7 47,0	467,000
	173	Neg.	127·50 51·30 124·30 56·15	89·400 87·800 90·225	88·600 89·012	88·806	at div. 85 10 28 58,5 36 15 44 52	at div. 90 10 28 39 36 35,5 44 29,5	by div. 85 15 53,5 7 56,75	by div. 90 15 50,5 7 55,25	475,608
	174	Pos.	56·15 157·80 64·60 154·10	106·975 111·200 109·350	109·087 110·275	109·681	at div. 105 10 52 39 11 1 12,5 8 48	at div. 110 10 52 54 11 0 56 9 5,5	by div. 105 16 9,0 8 4,50	by div. 110 16 11,5 8 5,75	485,670
	175	Neg.	154·10 36·26 147·00 43·30	95·180 91·630 95·150	93·405 93·390	93·397	at div. 90 11 17 36,5 25 25 33 58,5	at div. 95 11 17 23 25 39 33 43	by div. 90 16 22,0 8 11,0	by div. 95 16 20,0 8 10,0	490,321
T=46·00 B=29·850	176	Pos.	43·30 176·40 54·80 167·70	109·850 115·600 111·250	112·725 113·425	113·075	at div. 110 11 42 3,5 50 25,5 58 31,5	at div. 115 11 42 15 50 12 58 46	by div. 110 16 28,0 8 14,0	by div. 115 16 31,0 8 15,5	494,922
March 7 T=48·21 B=30·094	177	Neg.	100·30 81·00 97·70 81·90	90·650 89·350 89·800	90·000 89·575	89·787	at div. 89 9 44 38 52 31 10 1 27	at div. 90 9 44 21 52 50 10 1 7	by div. 89 16 49,0 8 24,5	by div. 90 16 46,0 8 23,0	503,320
	178	Pos.	81·90 136·70 87·70	109·300 112·200	110·750 Here	110·750 I was	at div. 109 10 10 4 18 56 interrupted	at div. 111 10 10 16 18 43 for an hour.			
	179	Neg.	127·60 67·20 121·92 71·10	97·400 94·560 96·510	95·980 95·535	95·757	at div. 95 11 26 17 34 23 42 45	at div. 100 11 25 51 34 52 42 14	by div. 95 16 28,0 8 14,0	by div. 100 16 23,0 8 11,5	493,622
	180	Pos.	71·10 153·60 78·32 146·50	112·350 115·960 112·410	114·155 114·185	114·170	at div. 110 11 50 56 59 44 0 7 23	at div. 115 11 51 15 59 23 0 7 46,5	by div. 110 16 27,0 8 13,50	by div. 115 16 31,5 8 15,75	495,376
Continued.	181	Neg.	146·50 47·54 136·74 55·04	97·020 92·140 95·890	94·580 94·015	94·297	at div. 90 0 16 22 24 6 32 52	at div. 95 0 16 6 24 23,5 32 32,5	by div. 90 16 30,0 8 15,00	by div. 95 16 26,5 8 13,25	493,496

4th SERIES continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T = 49·00 B = 30·124	182	Pos.	55·04 164·90 66·10 155·12	109·970 115·500 110·610	112·735 113·055	112·895	at div. 110 0 40 53 49 22 57 17	at div. 115 0 41 7,5 49 6 57 34,5	by div. 110 16 24,0 8 12,0	by div. 115 16 27,0 8 13,5	492,868
March 8 T = 51·70 B = 30·428	183	Pos.	122·40 123·24	122·820		122·820	The are too	small for	observing	the time.	
	184	Neg.	123·24 82·20 118·20 82·90	102·720 100·200 100·550	101·460 100·375	100·917	at div. 100 10 5 41 13 46 22 24	at div. 102 10 5 24,5 14 3 22 5	by div. 100 16 43,0 8 21,50	by div. 102 16 40,5 8 20,25	500,927
	185	Pos.	82·90 152·00 87·60 146·40	117·450 119·800 117·000	118·625 118·400	118·512	at div. 118 10 31 6 39 33 47 58	at div. 120 10 31 15,5 39 23 48 9	by div. 118 16 52,0 8 26,0	by div. 120 16 53,5 8 26,75	506,192
	186	Neg.	146·40 53·88 138·30 60·50	100·140 96·090 99·400	98·115 97·745	97·930	at div. 95 10 56 46,5 11 4 48,5 13 33	at div. 100 10 56 29 11 5 7 13 12	by div. 95 16 46,5 8 23,25	by div. 100 16 43,0 8 21,50	502,225
	187	Pos.	60·50 168·34 69·80 Here	114·420 119·070 I was	116·745 interrupt	116·745 ed for	at div. 115 11 21 48 30 13,5 above an hour	at div. 120 11 22 2,5 29 57			
	188	Pos.	136·80 99·04 133·40	117·920 116·220	117·070	117·070	at div. 115 0 53 13 1 0 54	at div. 120 0 52 31,5 1 1 39,5			
T = 52·35 B = 30·412	189	Neg.	133·40 64·40 126·50 69·10	98·900 95·450 97·800	97·175 96·625	96·900	at div. 95 1 9 52,5 17 49,5 26 23,5	at div. 100 1 9 29 18 15 25 55,5	by div. 95 16 31,0 8 15,50	by div. 100 16 26,5 8 13,25	494,645
March 9 T = 52·77 B = 30·458	190	Neg.	92·50 91·90	92·200		92·200	The are too	small for	observing	the time.	
	191	Pos.	91·90 120·00 93·10 117·50	105·950 106·550 105·300	106·250 105·925	106·087	at div. 106 9 57 36 10 4 43,5 11 51	at div. 107 9 57 45,5 10 4 33 12 2	by div. 106 14 15,0 7 7,50	by div. 107 14 16,5 7 8,25	427,565
	192	Neg.	117·50 66·00 113·00 69·00	91·750 89·500 91·000	90·625 90·250	90·437	at div. 90 10 19 20 26 23 33 33,5	at div. 92 10 19 9 26 35 33 21	by div. 90 14 13,5 7 6,75	by div. 92 14 12,0 7 6,00	426,586
Continued.	193	Pos.	69·00 137·88 73·52 133·40	103·440 105·700 103·460	104·570 104·580	104·575	at div. 100 10 40 33,5 48 17 54 44,5	at div. 105 10 40 53 47 56 55 7	by div. 100 14 11,0 7 5,5	by div. 105 14 14,0 7 7,0	426,872

4th Series continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	194	Neg.	133·40 48·20 127·10 52·92	90·800 87·650 90·010	89·225 88·830	89·027	at div. 85 11 2 35 9 17,5 16 54	at div. 90 11 2 18,5 9 34,5 16 35,5	by div. 85 14 19.0 7 9,5	by div. 90 14 17,0 7 8,5	* 428,695
	195	Pos.	52·92 150·90 59·52 145·50	101·910 105·210 102·510	103·560 103·860	103·710	at div. 100 11 23 49,5 31 22 38 11	at div. 105 11 24 3,5 31 7 38 27	by div. 100 14 21,5 7 10,75	by div. 105 14 23,5 7 11,75	431,492
	196	Neg.	145·50 35·70 138·30 42·50	90·600 87·000 90·400	88·800 88·700	88·750	at div. 85 11 45 53,5 52 47 0 0 30,5	at div. 90 11 45 41 53 3 0 0 16	by div. 85 14 37,0 7 18,5	by div. 90 14 35,0 7 17,5	437,750
	197	Pos.	42·50 164·60 54·64 162·28	103·550 109·620 108·460	106·585 109·040	107·812	at div. 105 0 7 47 15 23 22 33	at div. 110 0 7 59 15 10 22 46,5	by div. 105 14 46,0 7 23,0	by div. 110 14 47,5 7 23,75	443,422
	198	Neg.	162·28 30·00 155·20 37·20 Here	96·140 92·600 96·200 I was	94·370 94·400 interrupt	94·385 ed for	at div. 90 0 30 33,5 37 51 45 51 nearly an hour.	at div. 95 0 30 22,5 38 3 45 38,5	by div. 90 15 17,5 7 38,75	by div. 95 15 16,0 7 38,0	458,092
	199	Neg.	125·20 57·70 119·80 62·70	91·450 88·750 91·250	90·100 90·000	90·050	at div. 90 1 49 56 58 12 2 6 33	at div. 95 1 49 33 58 38 2 6 5	by div. 90 16 37,0 8 18,5	by div. 95 16 32,0 8 16,0	498,475
	200	Pos.	62·70 153·20 71·30 148·00	107·950 112·250 109·650	110·100 110·950	110·525	at div. 110 2 15 6,5 23 23,5 31 39	at div. 115 2 15 24 23 4 32 0	by div. 110 16 32,5 8 16,25	by div. 115 16 36,0 8 18,00	496,434
T = 53·10 B = 30·424	201	Neg.	148·00 40·28 139·50 47·30	94·140 89·890 93·400	92·015 91·645	91·830	at div. 90 2 40 18,5 48 21 56 52,5	at div. 95 2 40 3,5 48 37 56 35	by div. 90 16 34,0 8 17,00	by div. 95 16 31,5 8 15,75	496,543
March 10 T = 52·13 B = 30·500	202	Neg.	92·80 91·20	92·000		92·000	The arc too	small for	observing	the time.	
	203	Pos.	91·20 118·20 92·18 115·80	104·700 105·190 103·990	104·945 104·590	104·767	at div. 104 10 0 15,5 7 30 14 17	at div. 105 10 0 25 7 20 14 28	by div. 104 14 1,5 7 0,75	by div. 105 14 3,0 7 1,50	421,325
	204	Neg.	115·80 65·80 111·00 68·88	90·800 88·400 89·940	89·600 89·170	89·385	at div. 88 10 21 45 28 31 35 47,5	at div. 90 10 21 34 28 43 35 34,5	by div. 88 14 2,5 7 1,25	by div. 90 14 0,5 7 0,25	420,558
Continued.	205	Pos.	68·88 134·40 73·28 129·74	101·640 103·840 101·510	102·740 102·675	102·707	at div. 100 10 42 40 50 0 56 36,5	at div. 105 10 43 0,5 49 38 57 0	by div. 100 13 56,5 6 58,25	by div. 105 13 59,5 6 59,75	419,062

4th SERIES continued.—2-inch *Zinc* balls, with bifilar *silk* lines ; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	206	Neg.	129·74 49·10 123·00 54·00	89·420 86·050 88·500	87·735 87·275	87·505	at div. 85 11 4 4,5 10 48,5 18 6,5	at div. 90 10 3 40,8 11 7 17 47	by div. 85 14 2,0 7 1,0	by div. 90 13 59,0 6 59,5	* 420,249
	207	Pos.	54·00 144·92 60·08 139·00	99·460 102·500 99·540	100·980 101·020	101·000	at div. 100 11 25 4,5 32 8 39 3	at div. 105 11 25 19 31 52,5 39 20	by div. 100 13 58,5 6 59,25	by div. 105 14 1,0 7 0,50	419,500
	208	Neg.	139·00 37·14 131·80 43·26	88·070 84·470 87·530	86·270 86·000	86·135	at div. 85 11 46 15,5 53 12 0 0 20,5	at div. 90 11 46 2,5 53 26 0 0 5,5	by div. 85 14 5,0 7 2,5	by div. 90 14 3,0 7 1,5	422,273
	209	Pos.	43·26 154·32 51·74 148 90	98·790 103·030 100·320	100·910 101·675	101·292	at div. 100 0 7 27,5 14 40 21 41	at div. 105 0 7 39,5 14 26,5 21 55	by div. 100 14 13,5 7 6,75	by div. 105 14 15,5 7 7,75	427,008
	210	Neg.	148·90 31·40 142·90 42·80	90·150 87·150 92·850	88·650 90·000	89·325	at div. 85 0 29 13,5 36 11 44 2	at div. 90 0 29 1,5 36 23,5 43 48	by div. 85 14 48,5 7 24,25	by div. 90 14 46,5 7 23,25	443,385
	211	Pos.	42·80 170·78 56·70 166·78	106·790 113·740 111·740	110·265 112·740	111·502	at div. 110 0 51 21 58 54 1 6 14,5	at div. 115 0 51 32,5 58 41 1 6 27,5	by div. 110 14 53,5 7 26,75	by div. 115 14 55,0 7 27,50	446,975
	212	Neg.	166·78 31·40 159·10 36·50	99·090 95·250 97·800	97·170 96·525	96·847	at div. 95 1 14 7,5 21 41,5 29 39,5	at div. 100 1 13 56,5 21 53 29 27	by div. 95 15 32,0 7 46,00	by div. 100 15 30,5 7 45,25	465,723
T = 52·27 B = 30·468	213	Pos.	36·50 181·86 49·50 171·20	109·180 115·680 110·350	112·430 113·015	112·722	at div. 110 1 37 40 45 43 53 42	at div. 115 1 37 51 45 31 53 55,5	by div. 110 16 2,0 8 1,00	by div. 115 16 4,5 8 2,25	481,680
March 11 T = 51·57 B = 30·516	214	Pos.	113·40 113·30	113·350		113·350	The arc too	small for	observing	the time.	
	215	Neg.	113·30 85·10 110·50 88·28	99·200 97·800 99·390	98·500 98·595	98·547	at div. 98 9 59 26 10 6 28,5 13 54	at div. 99 9 59 16 10 6 39 13 42	by div. 98 14 28,0 7 14,0	by div. 99 14 26,0 7 13,0	433,453
	216	Pos.	88·28 136·00 92·60 131·88	112·140 114·300 112·240	113·220 113·270	113·245	at div. 112 10 20 56,5 28 13 35 0	at div. 114 10 21 8 28 0,5 35 14	by div. 112 14 3,5 7 1,75	by div. 114 14 6,0 7 3,00	422,528
Continued.	217	Neg.	131·88 67·28 124·30 72·30	99·580 95·790 98·300	97·685 97·045	97·365	at div. 96 10 42 28,5 49 24 56 39	at div. 98 10 42 20 49 33,5 56 28,5	by div. 96 14 10,5 7 5,25	by div. 98 14 8,5 7 4,25	424,568

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	218	Pos.	72·30 145·32 77·50 138·80	108·810 111·410 108·150	110·110 109·780	109·945	at div. 105 11 3 31,5 11 10 17 33	at div. 110 11 3 50 10 50 17 55	by div. 105 14 1,5 7 0,75	by div. 110 14 5,0 7 2,50	° 422,481
	219	Neg.	138·80 53·50 129·90 59·10	96·150 91·700 94·500	93·925 93·100	93·512	at div. 90 11 25 15,5 31 56 39 22,5	at div. 95 11 24 59,5 32 13,5 39 3	by div. 90 14 7,0 7 3,50	by div. 95 14 3,5 7 1,75	422,271
	220	Pos.	59·10 149·90 63·50 143·30	104·500 106·700 103·400	105·600 105·050	105·325	at div. 105 11 46 17,5 53 19,5 0 0 20,5	at div. 110 11 46 32,5 53 4 0 0 37	by div. 105 14 3,0 7 1,50	by div. 110 14 4,5 7 2,25	421,549
T=51·53 B=30·490	221	Neg.	143·30 38·90 136·72 43·00	91·100 87·810 89·860	89·455 88·835	89·145	at div. 85 0 7 36,5 14 14,5 21 33,5	at div. 90 0 7 23,5 14 28 21 19	by div. 85 13 57,0 6 58,50	by div. 90 13 55,5 6 57,75	417,878
March 12 T=50·71 B=30·396	222	Neg.	94·10 93·44 93·90	93·770 93·670	93·720	93·720	The are too	small for	observing	the time.	
	223	Pos.	93·90 119·12 94·20 116·42	106·510 106·660 105·310	106·585 105·985	106·285	at div. 106 10 9 6 16 11 23 10	at div. 107 10 9 15,5 16 0 23 22	by div. 106 14 4,0 7 2,00	by div. 107 14 6,5 7 3,25	422,356
	224	Neg.	116·42 67·50 110·32 71·50	91·960 88·910 90·910	90·435 89·910	90·172	at div. 90 10 30 20 37 22 44 24	at div. 92 10 30 9 37 35 44 10	by div. 90 14 4,0 7 2,0	by div. 92 14 1,0 7 0,5	421,871
	225	Pos.	71·50 133·50 76·46 129·10	102·500 104·980 102·780	103·740 103·880	103·810	at div. 102 10 51 26 58 40 11 5 21	at div. 104 10 51 34,5 58 30,5 11 5 31	by div. 102 13 55,0 6 57,50	by div. 104 13 56,5 6 58,25	418,179
	226	Neg.	129·10 52·00 121·70 57·40	90·550 86·850 89·550	88·700 88·200	88,450	at div. 85 11 12 49 19 25,5 27 11,5	at div. 90 11 12 31,5 19 45 26 50	by div. 85 14 22,5 7 11,25	by div. 90 14 18,5 7 9,25	429,870
	227	Pos.	57·40 143·28 61·80 137·70	100·340 102·540 99·750	101·440 101·145	101·292	at div. 100 11 33 40 40 45 47 36	at div. 105 11 33 55,5 40 29 47 53,5	by div. 100 13 56,0 6 58,0	by div. 105 13 58,0 6 59,0	418,258
	228	Neg.	137·70 37·60 130·50 41·40	87·650 84·050 85·950	85·850 85·000	85·425	at div. 85 11 54 45 0 1 38 8 37	at div. 90 11 54 31 0 1 52 8 21,5	by div. 85 13 52,0 6 56,00	by div. 90 13 50,5 6 55,25	415,936
Continued.	229	Pos.	41·40 152·32 48·46 145·70	96·860 100·390 97·080	98·625 98·735	98·680	at div. 95 0 15 36 22 58,5 29 45,5	at div. 100 0 15 48 22 45 29 59,5	by div. 95 14 9,5 7 4,75	by div. 100 14 11,5 7 5,75	425,486

4th SERIES continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=50·80 B=30·374	230	Neg.	145·70 26·20 139·64 33·40	85·950 82·920 86·520	84·435 84·720	84·577	at div. 80 0 37 23 44 16 52 2,5	at div. 85 0 37 11,5 44 28,5 51 49	by div. 80 14 39,5 7 19,75	by div. 85 14 37,5 7 18,75	* 438,835
March 14 T=50·67 B=30·374	231	Pos.	99·70 113·52 100·80 112·50	106·610 107·160 106·650	106·885 106·905	106·895	at div. 106 9 45 22 52 52 59 5	at div. 107 9 45 42 52 31 59 28	by div. 106 13 43,0 6 51,5	by div. 107 13 46,0 6 53,0	412,842
	232	Neg.	112·50 73·94 108·40 77·46	93·220 91·170 92·930	92·195 92·050	92·122	at div. 92 10 6 47,5 13 52 20 54	at div. 93 10 6 40,5 13 59 20 45	by div. 92 14 6,5 7 3,25	by div. 93 14 4,5 7 2,25	423,128
	233	Pos.	77·46 132·90 81·90 129·00	105·180 107·400 105·450	106·290 106·425	106·357	at div. 106 10 28 7,5 35 8 42 2	at div. 108 10 28 17 34 57 42 13,5	by div. 106 13 54,5 6 57,25	by div. 108 13 56,5 6 58,25	417,428
	234	Neg.	129·00 56·90 122·20 61·20	92·950 89·550 91·700	91·250 90·625	90·937	at div. 90 10 49 16,5 56 10 11 3 16	at div. 95 10 48 58 56 30,5 11 2 54	by div. 90 13 59,5 6 59,75	by div. 95 13 56,0 6 58,00	419,422
	235	Pos.	61·20 143·90 65·60 138·18	102·550 104·750 101·890	103·650 103·320	103·485	at div. 100 11 10 8 17 28,5 24 3	at div. 105 11 10 24 17 12 24 21,5	by div. 100 13 55,0 6 57,50	by div. 105 13 57,5 6 58,75	418,371
T=50·61 B=30·360	236	Neg.	138·18 41·20 130·80 45·40	89·690 86·000 88·100	87·845 87·050	87·447	at div. 85 11 31 26 missed. 45 19,5	at div. 90 11 31 12 missed. 45 4	by div. 85 13 53,5 6 56,75	by div. 90 13 52,0 6 56,00	416,383

5th SERIES.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
March 15 T=49·00 B=30·162	237	Pos.	97·30 108·40 99·00 107·00	102·850 103·700 103·000	103·275 103·350	103·312	at div. 103 9 57 49 10 4 9 9 53	at div. 104 9 58 11 11 3 45 10 22	by div. 103 12 4,0 6 2,0	by div. 104 12 11,0 6 5,5	363,092
	238	Neg.	107·00 80·88 104·22 82·24	93·940 92·550 93·230	93·245 92·890	93·067	at div. 93 10 16 19 22 13 28 9,5	at div. 94 10 16 10 22 23 27 59	by div. 93 11 50,5 5 55,25	by div. 94 11 49,0 5 54,50	355,200
	239	Pos.	82·24 120·80 86·46 116·62	101·520 103·630 101·540	102·575 102·585	102·580	at div. 102 10 34 25 40 32 46 25	at div. 103 10 34 31 40 25 46 32,5	by div. 102 12 0,0 6 0,00	by div. 103 12 1,5 6 0,75	360,435
Continued.	240	Neg.	116·62 69·70 110·70 72·40	93·160 90·200 91·550	91·680 90·875	91·277	at div. 90 10 52 43,5 58 25 11 4 31,5	at div. 92 10 52 33,5 58 36 11 4 19,5	by div. 90 11 48,0 5 54,0	by div. 92 11 46,0 5 53,0	353,361

5th SERIES continued.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	241	Pos.	72·40 124·00 77·10 117·90	98·200 100·530 97·500	99·375 99·025	99·200	at div. 98 21 10 25 16 35 22 23	at div. 100 11 10 34 16 25 22 34	by div. 98 11 58,0 5 39,0	by div. 100 12 0,0 6 0,0	359,600
T = 49·15 B = 30·160	242	Neg.	117·90 60·06 109·90 63·70	88·980 84·980 86·800	86·980 85·890	86·435	at div. 86 11 28 38 34 31 40 32	at div. 88 12 28 30 34 40 40 22	by div. 86 11 34,0 5 57,0	by div. 88 11 52,0 5 56,0	336,783
March 16 T = 30·63 B = 29·942	243	Pos.	102·30 111·50 102·60 109·70	106·900 107·050 106·150	106·973 106·600	106·787	at div. 106 9 41 2 47 48 33 18	at div. 107 9 41 27 47 23 53 50	by div. 106 12 16,0 6 8,0	by div. 107 12 23,0 6 11,3	370,754
	244	Neg.	109·70 83·40 105·48 84·30	96·330 94·440 94·890	95·493 94·663	95·080	at div. 95 10 0 1 5 52,5 11 44	at div. 96 9 39 32 10 6 3 12 33	by div. 95 11 43,0 5 31,3	by div. 96 11 41,0 5 50,5	351,420
	245	Pos.	84·30 221·30 87·68 117·28	102·800 104·490 102·480	103·643 103·485	103·565	at div. 103 10 18 2 24 9 30 4	at div. 104 10 18 8 24 2 30 11,5	by div. 103 12 2,0 6 1,00	by div. 104 12 3,3 6 1,73	361,424
	246	Neg.	117·28 70·50 110·92 73·52	93·890 90·710 92·220	92·300 91·465	91·882	at div. 90 10 36 26 42 6 48 26	at div. 92 10 36 16 42 17 48 13,5	by div. 90 12 0,0 6 0,00	by div. 92 11 57,5 5 58,75	358,824
	247	Pos.	73·32 125·28 78·46 120·00	99·400 101·870 99·230	100·635 100·530	100·592	at div. 100 10 54 28 11 0 38,5 6 40	at div. 102 10 34 37 11 0 28,5 6 51	by div. 100 12 12,0 6 6,0	by div. 102 12 14,0 6 7,0	366,296
T = 50·68 B = 29·912	248	Neg.	120·00 62·20 111·80 65·94	91·100 87·000 88·870	89·050 87·935	88·492	at div. 88 11 13 3 19 6 25 16,5	at div. 90 11 12 55 19 16 23 6	by div. 88 12 13,5 6 6,73	by div. 90 12 11,0 6 5,30	366,443
March 17 T = 52·57 B = 29·630	249	Pos.	100·00 116·70 102·70 113·90	108·330 109·700 109·300	109·025 109·500	109·262	at div. 109 10 42 16 50 7 57 44	at div. 110 10 42 35 49 46 58 7	by div. 109 13 28,0 7 44,0	by div. 110 15 32,0 7 46,0	464,524
	250	Neg.	113·90 72·90 109·70 77·60	94·400 91·300 93·650	92·850 92·475	92·662	at div. 92 11 6 22,5 14 11 22 28	at div. 93 11 6 15 14 19 5 22 18	by div. 92 16 5,3 8 2,73	by div. 93 16 3,0 8 1,30	481,923
	251	Pos.	77·60 137·30 87·30 130·70	207·450 112·300 109·000	109·875 110·630	110·262	at div. 110 11 30 44 38 42 46 38,5	at div. 112 11 30 54,5 38 29 46 33	by div. 110 15 54,5 7 57,23	by div. 112 15 58,5 7 59,25	477,512
Continued.	252	Neg.	130·70 63·30 121·20 71·80	97·000 92·250 96·500	94·625 94·375	94·500	at div. 94 11 54 53 0 2 37 10 37	at div. 96 12 54 44 0 2 47,5 10 24,5	by div. 94 15 44,0 7 52,00	by div. 96 15 40,5 7 50,25	471,563

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	253	Pos.	71·80 144·44 83·86 135·92	108·120 114·150 109·890	111·135 112·020	111·577	at div. 110 0 18 31 26 36 34 14	at div. 115 0 18 52 26 11,5 34 44	by div. 110 15 43,0 7 51,5	by div. 115 15 52,0 7 56,0	472,919
T=53·00 B=29·624	254	Neg.	135·92 61·84 124·70 71·74	98·880 93·270 98·220	96·075 95·745	95·910	at div. 95 0 42 35 50 22,5 58 38.	at div. 100 0 42 14 50 47,5 58 9	by div. 95 16 3,0 8 1,5	by div. 100 15 55,0 7 57,5	480·772

On noticing that the result of this day's observations was somewhat different from that of the two preceding days, I instituted another series, in the course of the present day, in order to see if the same tendency existed. The following experiments fully confirm the accuracy of the preceding ones, on this same day.

It is singular that, when the masses are put in motion, the point of rest also moves considerably. This was notoriously the case in the present instance. In the preceding experiments on this day the point of rest had moved, as usual: but at the close of the experiments the torsion rod was returning to its former position. But when the masses were again put in motion, in the following experiments, the point of rest again advanced.

March 17 T=53·00 B=29·624	255	Neg.	89·30 95·24 89·92	92·270 92·580	92·425	92·425	The arc too	small for	observing	the time.	
	256	Pos.	89·92 125·92 96·90 122·68	107·920 111·410 109·790	109·665 110·600	110·132	at div. 109 2 44 7 52 13 59 34	at div. 110 2 44 15 52 3 59 46	by div. 109 15 27,0 7 43,5	by div. 110 15 31,0 7 45,5	465,764
	257	Neg.	122·68 71·78 115·32 80·00	97·230 93·550 97·660	95·390 95·605	95·497	at div. 95 3 8 1 15 51 23 58	at div. 96 3 7 55 15 58 23 49,5	by div. 95 15 57,0 7 58,50	by div. 96 15 54,5 7 57,25	477,879
	258	Pos.	80·00 140·80 90·90 133·60	110·400 115·850 112·250	113·125 114·050	113·587	at div. 112 3 31 49,5 39 54 47 25	at div. 114 3 31 59,5 39 42 47 39,5	by div. 112 15 35,5 7 47,75	by div. 114 15 40,0 7 50,00	469,525
	259	Neg.	133·60 67·50 123·12 77·30	100·550 95·310 100·210	97·930 97·760	97·845	at div. 96 3 55 52,5 4 3 26 11 47,5	at div. 98 3 55 43 4 3 36,5 11 34	by div. 96 15 55,0 7 57,5	by div. 98 15 51,0 7 55,5	475,655
T=53·61 B=29·618	260	Pos.	77·30 146·18 89·60 136·90	111·740 117·890 113·250	114·815 115·570	115·192	at div. 114 4 19 35 27 34,5 35 15	at div. 116 4 . 19 44 27 24 35 28	by div. 114 15 40,0 7 50,0	by div. 116 15 44,0 7 52,0	471,192
March 18 T=52·51 B=29·464	261	Pos.	102·10 111·60 102·60 110·00	106·850 107·100 106·300	106·975 106·700	106·837	at div. 106 9 51 52 58 40 10 4 5	at div. 107 9 52 17 58 13 10 4 35	by div. 106 12 13,0 6 6,5	by div. 107 12 18,0 6 9,0	368,592
Continued.	262	Neg.	110·00 82·80 106·10 84·20	96·400 94·450 95·150	95·425 94·800	95·112	at div. 95 10 10 46 16 45 22 45,5	at div. 96 10 10 37 16 55 22 35	by div. 95 11 59,5 5 59,75	by div. 96 11 58,0 5 59,00	359,666

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	263	Pos.	84·20 122·90 87·34 118·90	103·550 105·120 103·120	104·375 104·120	104·250	at div. 104 10 29 3 missed. 41 16	at div. 105 10 29 9,5 missed. 41 23,5	by div. 104 12 13,0 6 6,5	by div. 105 12 14,0 6 7,0	s 366,625
	264	Neg.	118·90 69·04 112·32 72·36	93·970 90·680 92·340	92·325 91·510	91·917	at div. 90 10 47 45 53 32 59 59,5	at div. 92 10 47 35 53 42,5 59 47,5	by div. 90 12 14,5 6 7,25	by div. 92 12 12,5 6 6,25	366,292
	265	Pos.	72·36 128·94 79·76 127·10	100·650 104·350 103·430	102·500 103·890	103·195	at div. 102 11 6 16,5 12 38 18 43,5	at div. 104 11 6 25 12 28,5 18 54	by div. 102 12 27,0 6 13,5	by div. 104 12 29,0 6 14,5	374,097
T=52·63 B=29·500	266	Neg.	127·10 56·00 120·62 67·00	91·550 88·310 93·810	89·930 91·060	90·495	at div. 90 11 25 31 32 8,5 39 13,5	at div. 92 11 25 24 32 16 39 4	by div. 90 13 42,5 6 51,25	by div. 92 13 40,0 6 50,00	410,941
March 19 T=51·45 B=29·642	267	Pos.	102·00 112·60 103·60 110·90	107·300 108·100 107·250	107·700 107·675	107·687	at div. 107 9 58 16 10 5 4 10 40	at div. 108 9 58 39 10 4 37,5 11 11	by div. 107 12 24,0 6 12,0	by div. 108 12 32,0 6 16,0	374,748
	268	Neg.	110·90 83·90 106·94 87·30	97·400 95·420 97·120	96·410 96·270	96·340	at div. 96 10 17 29 23 33,5 29 50	at div. 97 10 17 20 23 44 29 38	by div. 96 12 21,0 6 10,5	by div. 97 12 18,0 6 9,0	369,990
	269	Pos.	87·30 125·52 93·64 121·70	106·410 109·580 107·670	107·995 108·625	108·310	at div. 108 10 36 7 42 19,5 48 22,5	at div. 109 10 36 13 42 11,5 48 30,5	by div. 108 12 15,5 6 7,75	by div. 109 12 17,5 6 8,75	368,060
	270	Neg.	121·70 76·80 115·84 80·60	99·250 96·320 98·220	97·785 97·270	97·527	at div. 97 10 54 47 11 0 51 7 5,5	at div. 98 10 54 42 11 0 57 6 59	by div. 97 12 18,5 6 9,25	by div. 98 12 17,0 6 8,50	368,856
	271	Pos.	80·60 132·20 85·80 127·20	106·400 109·000 106·500	107·700 107·750	107·725	at div. 106 11 13 15 19 43,5 25 37	at div. 108 11 13 24 19 33 25 48,5	by div. 106 12 22,0 6 11,00	by div. 108 12 24,5 6 12,25	372,078
T=51·51 B=29·632	272	Neg.*	127·20 68·10 120·70 71·40	97·650 94·400 96·050	96·025 95·225	95·625	at div. 94 11 32 13 38 12 44 39	at div. 96 11 32 5 38 21 44 29,5	by div. 94 12 26,0 6 13,00	by div. 96 12 24,5 6 12,25	372,391
				Here	I was	interrupt	ed for 3½ hours.				
	273	Pos.	93·90 133·80 100·50 130·80	113·850 117·150 115·650	115·500 116·400	115·950	at div. 115 3 26 7 33 45 40 56	at div. 116 3 26 14 33 36 41 6	by div. 115 14 49,0 7 24,5	by div. 116 14 52,0 7 26,0	445,925
Continued.	274	Neg.	130·80 74·00 119·80 79·30	102·400 96·900 99·550	99·650 98·225	98·937	at div. 98 3 49 16 56 55 4 5 1	at div. 100 3 49 5 57 8 4 4 46	by div. 98 15 45,0 7 52,5	by div. 100 15 41,0 7 50,5	471,563

5th SERIES continued.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T = 51·87 B = 29·670	275	Pos.	79·30 143·10 89·50 135·00	111·200 116·300 112·250	113·750 114·275	114·012	at div. 114 4 13 15 21 3 29 5	at div. 116 4 13 24,5 20 52,5 29 19	by div. 114 15 50,0 7 55,00	by div. 116 15 54,5 7 57,25	475,013
			This	series	differs preceding	very con series,	siderably, both although made	in duration and within 4 hours	deviation, after.	from the	
March 20 T = 50·90 B = 29·640	276	Pos.	104·90 114·48 105·52 113·00	109·690 110·000 109·260	109·845 109·630	109·737	at div. 109 9 53 38 10 0 8 5 30	at div. 110 9 54 1,5 59 43 10 5 59	by div. 109 11 52,0 5 56,00	by div. 110 11 57,5 5 58,75	358,026
	277	Neg.	113·00 86·90 109·34 88·22	99·950 98·120 98·780	99·035 98·450	98·742	at div. 98 10 12 0 17 37 23 41	at div. 99 10 11 51,5 17 46,5 23 30,5	by div. 98 11 41,0 5 50,5	by div. 99 11 39,0 5 49,5	349,758
	278	Pos.	88·22 125·00 91·48 121·00	106·610 108·240 106·240	107·425 107·240	107·332	at div. 107 10 29 43,5 35 44 41 41	at div. 108 10 29 49,5 35 37,5 41 48	by div. 107 11 57,5 5 58,75	by div. 108 11 58,5 5 59,25	358,916
	279	Neg.	121·00 74·10 114·22 76·80	97·550 94·160 95·510	95·850 94·835	95·342	at div. 94 10 47 59 53 45 11 0 1	at div. 96 10 47 49 53 56,5 59 48	by div. 94 12 2,0 6 1,0	by div. 96 11 59,0 5 59,5	359,994
	280	Pos.	76·80 128·92 82·32 124·10	102·860 105·620 103·210	104·240 104·415	104·327	at div. 104 11 6 15 12 29 18 43	at div. 106 11 6 24 12 18 18 55	by div. 104 12 28,0 6 14,0	by div. 106 12 31,0 6 15,5	374,245
	281	Neg.	124·10 65·98 116·50 70·60	95·040 91·240 93·550	93·140 92·395	92·767	at div. 90 11 25 28 31 28 38 35	at div. 95 11 25 7 31 53 38 6	by div. 90 13 7,0 6 33,5	by div. 95 12 59,0 6 29,5	391,286
	282	Pos.	70·60 124·90 78·72 118·80	97·750 101·810 98·760	99·780 100·285	100·032	at div. 100 11 45 51 53 28 0 1 6,5	at div. 105 11 46 18 52 56,5 0 1 45	by div. 100 15 15,5 7 37,75	by div. 105 15 27,0 7 43,50	457,787
	283	Neg.	118·80 56·92 109·32 67·72	87·860 83·120 88·520	85·490 85·820	85·655	at div. 85 0 9 11 16 37,5 24 34	at div. 90 0 8 47 17 6 23 58,5	by div. 85 15 23,0 7 41,50	by div. 90 15 11,5 7 35,75	460,747
			I cannot duration during as fol	account which the day. low.	for the took For after	sudden place in an inter	alteration in experiments val of two	the resting 282 and 283; hours, I con	point, and and which tinued the	in the continued observations	
Continued.	284	Pos.	89·90 128·80 97·60 124·74	109·350 113·200 111·170	111·275 112·185	111·730	at div. 111 2 53 26 3 1 30 9 10	at div. 112 2 53 34 3 1 20 9 21	by div. 111 15 44,0 7 52,0	by div. 112 15 47,0 7 53,5	473,095

5th SERIES continued.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	285	Neg.	124·74 71·72 117·48 80·60	98·230 94·600 99·040	96·415 96·820	96·617	at div. 96 3 17 34,5 25 26 33 36	at div. 97 3 17 29 25 33 33 28	by div. 96 16 1,5 8 0,75	by div. 97 15 59,0 7 59,50	479,979
	286	Pos.	80·60 143·20 91·52 135·60	111·900 117·360 113·560	114·630 115·460	115·045	at div. 115 3 41 35 49 22 57 9,5	at div. 120 3 41 59 48 53 57 44	by div. 115 15 34,5 7 47,25	by div. 120 15 45,0 7 52,50	467,297
T=51·17 B=29·620	287	Neg.	135·60 68·72 125·90 77·80	102·160 97·310 101·850	99·735 99·580	99·657	at div. 95 4 5 27,5 12 31 21 14	at div. 100 4 5 5 12 57 20 42	by div. 95 15 46,5 7 53,25	by div. 100 15 37,0 7 48,50	468,826

6th SERIES.—1½-inch *Platina* balls, with bifilar *silk* lines; distance = ·177 inch.

March 24 T=53·21 B=30·276	288	Pos.	98·00 115·80 98·40 114·70	106·900 107·100 106·550	107·000 106·825	106·912	at div. 106 9 39 36 47 57 55 18	at div. 107 9 39 53 47 40 55 36	by div. 106 15 42,0 7 51,0	by div. 107 15 43,0 7 51,5	471,456
	289	Neg.	114·70 63·60 111·50 62·50	89·150 87·550 87·000	88·350 87·275	87·812	at div. 87 10 3 41 11 16 19 16	at div. 88 10 3 35,5 11 22 19 9,5	by div. 87 15 35,0 7 47,5	by div. 88 15 34,0 7 47,0	467,094
	290	Pos.	62·50 147·82 69·00 146·40	105·160 108·410 107·700	106·785 108·055	107·420	at div. 105 10 27 32,5 36 7 44 7,5	at div. 110 10 27 51 35 46,5 44 28,5	by div. 105 16 35,0 8 17,50	by div. 110 16 37,5 8 18,75	498,105
	291	Neg.	146·40 36·84 142·50 44·80	91·620 89·670 93·650	90·645 91·660	91·152	at div. 90 10 52 53 11 1 8 9 46,5	at div. 95 10 52 38,5 11 1 23,5 9 30	by div. 90 16 53,5 8 26,75	by div. 95 16 51,5 8 25,75	506,520
	292	Pos.	44·80 177·90 55·60 173·30	111·350 116·750 114·450	114·050 115·600	114·825	at div. 110 11 18 4 26 44 34 44,5	at div. 115 11 18 16 26 31 34 58,5	by div. 110 16 40,5 8 20,25	by div. 115 16 42,5 8 21,25	501,215
T=53·38 B=30·288	293	Neg.	173·30 24·80 165·00 34·80	99·050 94·900 99·900	96·975 97·400	97·187	at div. 95 11 43 32,5 51 49 0 0 29	at div. 100 11 43 21 52 1 0 0 16,5	by div. 95 16 56,5 8 28,25	by div. 100 16 55,5 8 27,75	508,063
March 25 T=52·57 B=30·150	294	Pos.	105·30 120·70 105·30 120·14	113·000 113·000 112·720	113·000 112·860	112·930	at div. 112 9 41 41 49 31 56 20	at div. 113 9 41 59 49 12 56 38,5	by div. 112 14 39,0 7 19,50	by div. 113 14 39,5 7 19,75	439,732
Continued.	295	Neg.	120·14 75·46 118·68 76·70	97·800 97·070 97·690	97·435 97·380	97·407	at div. 97 10 4 16 11 36 19 6	at div. 98 10 4 9,5 11 43 18 58,5	by div. 97 14 50,0 7 25,0	by div. 98 14 49,0 7 24,5	444,797

6th Series continued.—1½-inch *Platina* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	296	Pos.	76·70 145·70 77·68 141·82	111·200 111·690 109·750	111·445 110·720	111·082	at div. 110 10 26 31 33 59 41 15	at div. 112 10 26 39 33 51 41 24	by div. 110 14 44,0 7 22,0	by div. 112 14 45,0 7 22,5	* 442·270
	297	Neg.	141·82 48·38 136·72 50·78	95·100 92·550 93·750	93·825 93·150	93·487	at div. 90 10 48 53 55 51,5 11 3 31,5	at div. 95 10 48 38 56 7 11 3 15	by div. 90 14 38,5 7 19,25	by div. 95 14 37,0 7 18,50	438·727
	298	Pos.	50·78 161·60 55·58 155·80	106·190 108·590 105·690	107·390 107·140	107·265	at div. 105 11 10 45 18 13,5 25 24	at div. 110 11 10 57,5 18 0,5 25 38	by div. 105 14 39,0 7 19,50	by div. 110 14 40,5 7 20,25	439·840
T=52·67 B=30·080	299	Neg.	155·80 30·60 149·20 38·32	93·200 89·900 93·760	91·550 91·830	91·690	at div. 90 11 33 56 40 12 47 40,5	at div. 95 11 33 45 40 24 47 28	by div. 90 14 44,5 7 22,25	by div. 95 14 43,0 7 21,50	441·997
March 26 T=53·08 B=29·728	300	Pos.	102·60 119·28 103·10 118·52	110·940 111·190 110·810	111·065 111·000	111·032	at div. 111 9 44 35 51 54 59 16	at div. 112 9 44 52 51 36 59 34	by div. 111 14 41,0 7 20,5	by div. 112 14 42,0 7 21,0	440·516
	301	Neg.	118·52 72·80 115·52 73·70	95·660 94·160 94·610	94·910 94·385	94·647	at div. 94 10 7 3 14 16 21 43	at div. 95 10 6 57 14 22 21 36,5	by div. 94 14 40,0 7 20,00	by div. 95 14 39,5 7 19,75	439·838
	302	Pos.	73·70 142·90 76·20 138·40	108·300 109·550 107·300	108·925 108·425	108·675	at div. 107 10 29 9,5 36 47 44 0	at div. 109 10 29 17,5 36 38,5 44 9	by div. 107 14 50,5 7 25,25	by div. 109 14 51,5 7 25,75	445·668
	303	Neg.	138·40 46·10 132·70 50·30	92·250 89·400 91·500	90·825 90·450	90·637	at div. 90 10 51 40 59 3 11 6 34	at div. 92 10 51 34 59 10 11 6 27	by div. 90 14 54,0 7 27,0	by div. 92 14 53,0 7 26,5	446·841
	304	Pos.	50·30 165·60 57·46 163·90	107·950 111·530 110·680	109·740 111·105	110·422	at div. 110 11 14 11 21 57,5 29 43,5	at div. 115 11 14 24 21 44 29 58	by div. 110 15 32,5 7 46,25	by div. 115 15 34,0 7 47,00	466·313
	305	Neg.	163·90 29·30 160·90 36·60	96·600 95·100 98·750	95·850 96·925	96·387	at div. 95 11 37 51 45 46 54 1,5	at div. 100 11 37 39,5 45 58 53 49	by div. 95 16 10,5 8 5,25	by div. 100 16 9,5 8 4,75	485·111
	306	Pos.	36·60 193·70 45·92 187·40	115·150 119·810 116·660	117·480 118·235	117·857	at div. 115 0 2 6,5 10 17 18 18	at div. 120 0 2 16,5 10 6,5 18 29,5	by div. 115 16 11,5 8 5,75	by div. 120 16 13,0 8 6,50	486,177
Continued.	307	Neg.	187·40 15·70 177·48 24·80	101·550 96·590 101·140	99·070 98·865	98·967	at div. 95 0 26 47,5 34 46 43 17	at div. 100 0 26 38 34 56 43 6,5	by div. 95 16 29,5 8 14,75	by div. 100 16 28,5 8 14,25	494·353

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	308	Pos.	24·80 205·40 35·74 196·20	115·100 120·570 115·970	117·835 118·270	118·025	at div. 115 0 51 24 59 41 1 7 33	at div. 120 0 51 33 59 31,5 1 7 43	by div. 115 16 9,0 8 4,5	by div. 120 16 10,0 8 5,0	s 484,802
T = 53·88 B = 29·640	309	Neg.	196·20 7·20 184·60 17·60	101·700 95·900 101·100	98·800 98·500	98·650	at div. 95 1 16 10 24 10,5 32 37	at div. 100 1 16 2 24 19 32 28	by div. 95 16 27,0 8 13,5	by div. 100 16 26,0 8 13,0	493,135
			There is a singular disturbance in the motion of the resting point, during this day, for which I cannot account.								
March 27 T = 54·20 B = 29·790	310	Pos.	101·10 116·98 101·42 115·92	109·040 109·200 108·670	109·120 108·935	109·027	at div. 109 11 41 31 49 3 56 35	at div. 110 11 41 49 48 45 56 55	by div. 109 15 4,0 7 32,0	by div. 110 15 6,0 7 33,0	452,027
	311	Neg.	115·92 69·20 112·30 69·94	92·560 90·750 91·120	91·655 90·935	91·295	at div. 91 0 4 27 11 51 19 22	at div. 92 0 4 21 11 58 19 15	by div. 91 14 55,0 7 27,5	by div. 92 14 54,0 7 27,0	447,353
	312	Pos.	69·94 144·75 75·20 144·75	107·345 109·975 109·975	108·660 109·975	109·317	at div. 109 0 27 11 34 55,5 42 43,5	at div. 111 0 27 19 34 47 42 52	by div. 109 15 32,5 7 46,25	by div. 111 15 33,0 7 46,50	446,289
	313	Neg.	144·75 45·10 141·70 50·40	94·925 93·400 96·050	94·162 94·725	94·443	at div. 90 0 51 11 58 45 1 7 18,5	at div. 95 0 50 55,5 59 1 1 7 1,5	by div. 90 16 7,5 8 3,75	by div. 95 16 6,0 8 3,00	483,084
	314	Pos.	50·40 176·50 58·34 173·70	113·450 117·420 116·020	115·435 116·720	116·077	at div. 115 1 15 17,5 23 22,5 31 26	at div. 120 1 15 30 23 9 31 40	by div. 115 16 8,5 8 4,25	by div. 120 16 10,0 8 5,00	484,412
T = 54·47 B = 29·814	315	Neg.	173·70 26·64 166·32 34·10	100·170 96·480 100·210	98·325 98·345	98·335	at div. 95 1 39 54 47 55 56 25	at div. 100 1 39 43,5 48 6 56 13	by div. 95 16 31,0 8 15,50	by div. 100 16 29,5 8 14,75	495,000
March 28 T = 52·67 B = 29·960	316	Pos.	108·00 125·32 109·28 124·80	116·660 117·300 117·040	116·980 117·170	117·075	at div. 117 9 47 7 54 39 10 2 12	at div. 118 9 47 24 54 21 10 2 31	by div. 117 15 5,0 7 32,5	by div. 118 15 7,0 7 33,5	452,575
	317	Neg.	124·80 78·20 122·96 81·12	101·500 100·580 102·040	101·040 101·310	101·175	at div. 101 10 10 9 17 48 25 29,5	at div. 102 10 10 3 17 55 25 22,5	by div. 101 15 20,5 7 40,25	by div. 102 15 19,5 7 39,75	460,163
Continued.	318	Pos.	81·12 152·90 84·94 149·00	117·010 118·920 116·970	117·965 117·945	117·955	at div. 116 10 33 4,5 40 54 48 14,5	at div. 118 10 33 12,5 40 45,5 48 23,5	by div. 116 15 10,0 7 35,0	by div. 118 15 11,0 7 35,5	455,489

6th Series continued.—1½-inch *Platina* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	319	Neg.	149·00 55·30 144·60 59·72	102·150 99·950 102·160	101·050 101·055	101·052	at div. 100 10 56 5 11 3 36 11 17	at div. 105 10 55 49,5 11 3 52 11 0	by div. 100 15 12,0 7 36,00	by div. 105 15 10,5 7 35,25	• 455,842
	320	Pos.	59·72 171·30 63·84 166·00	115·510 117·570 114·920	116·540 116·245	116·392	at div. 115 11 18 51,5 26 28 33 57	at div. 120 11 19 4,5 26 14,5 34 11,5	by div. 115 15 5,5 7 32,75	by div. 120 15 7,0 7 33,50	452,959
	321	Neg.	166·00 35·80 160·80 41·10	100·900 98·300 100·950	99·600 96·625	99·612	at div. 95 11 41 44 48 56 56 48,5	at div. 100 11 41 33 49 7,5 56 36,5	by div. 95 15 4,5 7 32,25	by div. 100 15 3,5 7 31,75	451,789
	322	Pos.	41·10 185·80 44·80 180·10	113·450 115·300 112·450	114·375 113·875	114·125	at div. 110 0 4 2,5 missed. 18 58	at div. 115 0 4 12,5 missed. 19 8,5	by div. 110 14 55,5 7 27,75	by div. 115 14 56,0 7 28,00	447,956
	323	Neg.	180·10 15·70 174·50 18·80	97·900 95·100 96·650	96·500 95·875	96·187	at div. 95 0 26 39 34 5,5 41 43	at div. 100 0 26 30 34 11,5 41 33,5	by div. 95 15 4,0 7 32,00	by div. 100 15 3,5 7 31,75	451,941
T = 52·85 B = 29·950	324	Pos.	18·80 201·70 24·80 195·20	110·250 113·250 110·000	111·750 111·625	111·687	at div. 110 0 49 21,5 57 11 1 4 52,5	at div. 115 0 49 29,5 57 3 1 5 1	by div. 110 15 31,0 7 45,50	by div. 115 15 31,5 7 45,75	465,584
March 30 T = 52·71 B = 29·924	325	Neg.	103·80 87·12 102·80 87·90	95·460 94·960 95·350	95·210 95·155	95·182	at div. 95 9 51 15,5 58 43 10 6 21,5	at div. 96 9 50 58 59 2 10 6 2	by div. 95 15 6,0 7 33,0	by div. 96 15 4,0 7 32,0	452,818
	326	Pos.	87·90 134·40 89·96 132·30	111·150 112·180 111·130	111·665 111·655	111·660	at div. 111 10 13 53 21 34 28 59	at div. 112 10 13 59 21 27 29 6	by div. 111 15 6,0 7 33,0	by div. 112 15 7,0 7 33,5	453,330
	327	Neg.	132·30 59·50 128·94 62·90	95·900 94·220 95·920	95·060 95·070	95·065	at div. 94 10 36 48 44 16 51 59	at div. 96 10 36 40 44 24 51 50,5	by div. 94 15 11,0 7 35,50	by div. 96 15 10,5 7 35,25	455,367
	328	Pos.	62·90 158·12 66·84 154·50	110·510 112·480 110·670	111·495 111·575	111·535	at div. 110 10 59 31 11 7 14 14 38,5	at div. 115 10 59 46 11 6 58 14 55	by div. 110 15 7,5 7 33,75	by div. 115 15 9,0 7 34,50	453,980
	329	Neg.	154·50 37·70 149·76 41·20	96·100 93·730 95·480	94·915 94·605	94·760	at div. 90 11 22 31,5 29 40,5 37 36,5	at div. 95 11 22 19 29 53 37 23	by div. 90 15 5,0 7 32,5	by div. 95 15 4,0 7 32,0	452,024
T = 52·80 B = 29·950	330	Pos.	41·20 177·92 45·70 172·90	109·560 111·810 109·300	110·685 110·555	110·620	at div. 110 11 44 58,5 52 39 0 0 13,5	at div. 115 11 45 9 52 28 0 0 25	by div. 110 15 15,0 7 37,5	by div. 115 15 16,0 7 38,0	457,562

7th SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
March 31 T = 52·60 B = 29·672	331	Neg.	98·40 94·34 98·20 94·40	96·370 96·270 96·300	96·320 96·285	96·302	at div. 96 10 26 17 29 30 33 23	at div. 97 10 25 43 30 6 32 47	by div. 96 7 6,0 3 33,0	by div. 97 7 4,0 3 32,0	* 212,698
	332	Pos.	94·40 105·34 94·72 105·20	99·870 100·030 99·960	99·950 99·995	99·972	at div. 99 10 36 43 40 40 43 48	at div. 100 10 36 56 40 27 44 1	by div. 99 7 5,0 3 32,5	by div. 100 7 5,0 3 32,5	212,500
	333	Neg.	105·20 87·66 104·80 88·00	96·430 96·230 96·400	96·330 96·315	96·322	at div. 96 10 47 41 51 9 54 46,5	at div. 97 10 47 33 51 17 54 38	by div. 96 7 5,5 3 32,75	by div. 97 7 5,0 3 32,50	212,670
	334	Pos.	88·00 111·52 88·60 111·02	99·760 100·060 99·810	99·910 99·935	99·922	at div. 99 10 58 17 11 2 1,5 5 23	at div. 100 10 58 23 11 1 56 5 29,5	by div. 99 7 6,0 3 33,00	by div. 100 7 6,5 3 33,25	213,230
	335	Neg.	111·02 81·70 110·40 82·28	96·360 96·050 96·340	96·205 96·195	96·200	at div. 96 11 9 3 12 37 16 12	at div. 97 11 8 58 12 42 16 7	by div. 96 7 9,0 3 34,5	by div. 97 7 9,0 3 34,5	214,500
	336	Pos.	82·28 116·96 83·02 116·30	99·620 99·990 99·660	99·805 99·825	99·815	at div. 98 11 19 42 23 30 26 38	at div. 100 11 19 50 23 21,5 26 46	by div. 98 6 56,0 3 28,0	by div. 100 6 56,0 3 28,0	208,000
	337	Neg.	116·30 76·32 115·48 77·00	96·310 95·900 96·240	96·105 96·070	96·087	at div. 96 11 30 32 34 5 37 37,5	at div. 98 11 30 25 34 12 37 30,5	by div. 96 7 5,5 3 32,75	by div. 98 7 5,5 3 32,75	212,750
	338	Pos.	77·00 122·08 77·90 121·30	99·540 99·990 99·600	99·765 99·795	99·780	at div. 98 11 41 9 44 53 48 16	at div. 100 11 41 15 44 47,5 48 22	by div. 98 7 7,0 3 33,5	by div. 100 7 7,0 3 33,5	213,500
	339	Neg.	121·30 71·40 120·50 72·30	96·350 95·950 96·400	96·150 96·175	96·162	at div. 96 11 51 57 55 30,5 59 5	at div. 98 11 51 51,5 55 36 58 59,5	by div. 96 7 8,0 3 34,0	by div. 98 7 8,0 3 34,0	214,000
	340	Pos.	72·30 127·06 73·50 126·30	99·680 100·280 99·900	99·980 100·090	100·035	at div. 100 0 2 41 6 15 9 49	at div. 102 0 2 46 6 10 9 54	by div. 100 7 8,0 3 34,0	by div. 102 7 8,0 3 34,0	214,000
	341	Neg.	126·30 67·28 125·40 68·40	96·790 96·340 96·900	96·565 96·620	96·592	at div. 96 0 13 26 16 57,5 20 35	at div. 98 0 13 21,5 17 2,5 20 30	by div. 96 7 9,0 3 34,50	by div. 98 7 8,5 3 34,25	214,426
T = 52·80 B = 29·640	342	Pos.	68·40 131·70 69·90 130·60	100·050 100·800 100·250	100·425 100·525	100·475	at div. 100 0 21 10 27 47 31 19	at div. 102 0 21 14,5 27 42 31 23,5	by div. 100 7 9,0 3 34,5	by div. 102 7 9,0 3 34,5	214,500

7th SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
April 1 T=51·30 B=29·662	343	Pos.	97·80 101·60 97·90 101·50	99·700 99·750 99·700	99·725 99·725	99·725	at div. 99 9 46 29 50 52 53 31	at div. 100 9 47 4 50 16 54 9	by div. 99 7 2,0 3 31,0	by div. 100 7 5,0 3 32,5	212,087
	344	Neg.	101·50 90·72 101·26 91·00	96·110 95·990 96·130	96·050 96·060	96·055	at div. 96 9 57 43 10 1 14,5 4 48	at div. 97 9 57 31 10 1 27 4 35	by div. 96 7 5,0 3 32,5	by div. 97 7 4,0 3 32,0	212,473
	345	Pos.	91·00 108·18 91·68 107·88	99·590 99·930 99·780	99·760 99·855	99·807	at div. 99 10 8 22 12 7,5 15 26	at div. 100 10 8 30 11 59 15 34	by div. 99 7 4,0 3 32,0	by div. 100 7 4,0 3 32,0	212,000
	346	Neg.	107·88 84·90 107·20 85·40	96·390 96·050 96·300	96·220 96·175	96·197	at div. 96 10 19 13 22 43 26 18	at div. 97 10 19 7 22 49,5 26 12	by div. 96 7 5,0 3 32,5	by div. 97 7 5,0 3 32,5	212,500
	347	Pos.	85·40 113·82 86·30 113·20	99·610 100·060 99·750	99·835 99·905	99·870	at div. 98 10 29 45,5 33 37 36 50,5	at div. 100 10 29 55 33 27 37 0,5	by div. 98 7 5,0 3 32,50	by div. 100 7 5,5 3 32,75	212,734
	348	Neg.	113·20 79·70 112·40 80·12	96·450 96·050 96·260	96·250 96·155	96·202	at div. 96 10 40 36 44 7 47 41,5	at div. 98 10 40 28 44 15,5 47 33	by div. 96 7 5,5 7 32,75	by div. 98 7 5,0 7 32,50	212,725
	349	Pos.	80·12 119·10 81·30 118·10	99·610 100·200 99·700	99·905 99·950	99·927	at div. 95 10 50 56 55 7 58 3	at div. 100 10 51 15 54 48,5 58 22	by div. 95 7 7,0 3 33,5	by div. 100 7 7,0 3 33,5	213,500
	350	Neg.	118·10 74·74 117·40 75·60	96·420 96·070 96·500	96·245 96·285	96·265	at div. 95 11 2 0 5 25,5 9 5,5	at div. 100 11 1 44,5 5 41,5 8 49,5	by div. 95 7 5,5 3 32,75	by div. 100 7 5,0 3 32,50	212,687
	351	Pos.	75·60 123·50 76·50 122·70	99·550 100·000 99·600	99·775 99·800	99·787	at div. 95 11 12 23 16 23 19 27,5	at div. 100 11 12 37 16 9 19 42,5	by div. 95 7 4,5 3 32,25	by div. 100 7 5,5 3 32,75	212,729
	352	Neg.	122·70 69·94 121·78 70·70	96·320 95·860 96·240	96·090 96·050	96·070	at div. 95 11 23 19 26 46 30 24	at div. 100 11 23 6 26 59 30 11	by div. 95 7 5,0 3 32,5	by div. 100 7 5,0 3 32,5	212,500
	353	Pos.	70·70 128·20 71·52 127·52	99·450 99·860 99·520	99·655 99·690	99·672	at div. 95 11 33 45 37 40,5 40 50	at div. 100 11 33 57 37 28 41 2,5	by div. 95 7 5,0 3 32,50	by div. 100 7 5,5 3 32,75	212,734
T=51·41 B=29·676	354	Neg.	127·52 65·30 126·30 66·02	96·410 95·800 96·160	96·105 95·980	96·042	at div. 95 11 44 40,5 48 9 51 46	at div. 100 11 44 29,5 48 20 51 35	by div. 95 7 5,5 3 32,75	by div. 100 7 5,5 3 32,75	212,750

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
April 2 T = 50·80 B = 29·670	355	Neg.	99·20 94·80 99·00 95·00	97·000 96·900 97·000	96·950 96·950	96·950	at div. 96 9 50 27 52 58 57 33	at div. 97 9 49 55 53 31 56 59	by div. 96 7 6,0 3 33,0	by div. 97 7 4,0 3 32,0	* 212,050
	356	Pos.	95·00 106·10 95·30 105·84	100·550 100·700 100·570	100·625 100·635	100·630	at div. 100 10 0 29,5 4 17 7 35	at div. 101 10 0 42 4 4 7 48	by div. 100 7 5,5 3 32,75	by div. 101 7 6,0 3 33,00	212,907
	357	Neg.	105·84 88·20 105·44 87·34	97·020 96·820 96·390	96·920 96·605	96·762	at div. 96 10 11 31 14 50 18 37	at div. 97 10 11 23 14 58 18 29	by div. 96 7 6,0 3 33,0	by div. 97 7 6,0 3 33,0	213,000
	358	Pos.	87·34 112·30 88·88 111·92	99·820 100·590 100·400	100·205 100·495	100·350	at div. 100 10 22 6 25 44 29 11	at div. 101 10 22 11 25 38,5 29 17	by div. 100 7 5,0 3 32,5	by div. 101 7 6,0 3 33,0	212,675
	359	Neg.	111·92 81·88 111·32 82·30	96·900 96·600 96·810	96·750 96·705	96·727	at div. 96 10 32 54 36 20 40 0	at div. 98 10 32 45 36 29,5 39 50,5	by div. 96 7 6,0 3 33,00	by div. 98 7 5,5 3 32,75	212,909
	360	Pos.	82·30 117·90 82·86 117·40	100·100 100·380 100·130	100·240 100·255	100·247	at div. 100 10 43 31,5 47 7,5 50 38,5	at div. 102 10 43 39,5 47 0 50 46,5	by div. 100 7 7,0 3 33,5	by div. 102 7 7,0 3 33,5	213,500
	361	Neg.	117·40 76·00 116·70 76·50	96·700 96·350 96·600	96·525 96·475	96·500	at div. 95 10 54 20 57 43 11 1 26	at div. 100 10 54 4 58 0 11 1 9	by div. 95 7 6,0 3 33,0	by div. 100 7 5,0 3 32,5	212,850
	362	Pos.	76·50 123·36 77·10 122·74	99·930 100·230 99·920	100·080 100·075	100·077	at div. 100 11 4 56,5 8 30 12 3	at div. 105 11 5 11 8 16 12 18	by div. 100 7 6,5 3 33,25	by div. 105 7 7,0 3 33,50	213,254
	363	Neg.	122·74 70·40 122·10 70·90	96·570 96·250 96·500	96·410 96·375	96·392	at div. 95 11 15 42,5 19 8 22 49	at div. 100 11 15 29,5 19 22 22 36	by div. 95 7 6,5 3 33,25	by div. 100 7 6,5 3 33,25	213,250
	364	Pos.	70·90 128·70 71·90 128·00	99·800 100·300 99·950	100·050 100·125	100·087	at div. 100 11 26 21 29 55 33 28	at div. 105 11 26 32,5 29 43 33 40	by div. 100 7 7,0 3 33,50	by div. 105 7 7,5 3 33,75	213,504
	365	Neg.	128·00 65·50 127·22 66·72	96·750 96·360 96·970	96·555 96·665	96·610	at div. 95 11 37 7 40 34,5 44 16	at div. 100 11 36 56 40 45,5 44 5	by div. 95 7 9,0 3 34,5	by div. 100 7 9,0 3 34,5	214,500
Continued.	366	Pos.	66·72 133·70 68·18 132·60	100·210 100·940 100·390	100·575 100·665	100·620	at div. 100 11 47 48 51 24,5 54 57	at div. 105 11 47 58 51 14,5 55 7,5	by div. 100 7 9,0 3 34,50	by div. 105 7 9,5 3 34,75	214,531

7th SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	367	Neg.	132·60 61·96 131·32 63·28	97·280 96·640 97·300	96·960 96·970	96·965	at div. 95 11 58 38 0 2 5,5 5 48	at div. 100 11 58 28,5 0 2 15 5 38	by div. 95 7 10,0 3 35,00	by div. 100 7 9,5 3 34,75	214,902
	368	Pos.	63·28 137·38 64·84 135·90	100·330 101·110 100·370	100·720 100·740	100·730	at div. 100 0 9 20 12 58 16 30,5	at div. 105 0 9 29 12 48,5 16 40	by div. 100 7 10,5 3 35,25	by div. 105 7 11,0 3 35,50	215,286
	369	Neg.	135·90 58·70 134·40 60·10	97·300 96·550 97·250	96·925 96·900	96·912	at div. 95 0 20 12 23 40,5 27 23	at div. 100 0 20 3 23 49,5 27 13,5	by div. 95 7 11,0 3 35,50	by div. 100 7 10,5 3 35,25	215,404
	370	Pos.	60·10 140·34 61·60 138·80	100·220 100·970 100·200	100·595 100·585	100·590	at div. 100 0 30 54,5 34 32 38 5,5	at div. 105 0 31 3 34 23,5 38 14	by div. 100 7 11,0 3 35,5	by div. 105 7 11,0 3 35,5	215,500
	371	Neg.	138·80 55·68 137·18 57·20	97·240 96·430 97·190	96·835 96·810	96·822	at div. 95 0 41 46 45 15,5 48 57	at div. 100 0 41 37,5 45 24 48 48,5	by div. 95 7 11,0 3 35,5	by div. 100 7 11,0 3 35,5	215,500
	372	Pos.	57·20 143·00 59·08 141·30	100·100 101·040 100·190	100·570 100·615	100·592	at div. 100 0 52 30 56 8 59 41	at div. 105 0 52 38 55 59,5 59 49,5	by div. 100 7 11,0 3 35,50	by div. 105 7 11,5 3 35,75	215,530
	373	Neg.	141·30 53·30 139·40 55·00	97·300 96·350 97·200	96·825 96·775	96·800	at div. 95 1 3 21 6 51 10 32,5	at div. 100 1 3 13,5 6 59 10 24,5	by div. 95 7 11,5 3 35,75	by div. 100 7 11,0 3 35,50	215,660
	374	Pos.	55·00 145·00 57·10 143·20	100·000 101·050 100·150	100·525 100·600	100·562	at div. 100 2 14 5,5 17 43 21 16,5	at div. 105 1 14 13 17 35 21 24,5	by div. 100 7 11,0 3 35,50	by div. 105 7 11,5 3 35,75	215,528
	375	Neg.	143·20 51·70 140·84 53·80	97·450 96·270 97·320	96·860 96·795	96·827	at div. 95 1 24 58 28 28 32 9,5	at div. 100 1 24 51 28 36 32 2	by div. 95 7 11,5 3 35,75	by div. 100 7 11,0 3 35,50	215,659
T = 51·27 B = 29·700	376	Pos.	53·80 146·30 55·90 144·28	100·050 101·100 100·090	100·575 100·595	100·585	at div. 100 2 35 42,5 39 20 42 54	at div. 105 1 35 50 39 12 43 2	by div. 100 7 11,5 3 35,75	by div. 105 7 12,0 3 36,00	215,779
April 3 T = 49·53 B = 29·710	377	Neg.	98·74 95·20 98·64 95·30	96·970 96·920 96·970	96·945 96·945	96·945	at div. 96 10 55 16 missed. 11 2 22	at div. 97 10 54 35 58 14 11 1 40	by div. 96 7 6,0 3 33,0	by div. 97 7 5,0 3 32,5	212,528
Continued.	378	Pos.	95·30 105·80 95·60 105·54	100·550 100·700 100·570	100·625 100·635	100·630	at div. 100 11 5 17 9 6 12 20,5	at div. 101 11 5 30,5 8 52,5 12 34	by div. 100 7 3,5 3 31,75	by div. 101 7 3,5 3 31,75	211,750

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1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean. or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	379	Neg.	105·54 88·60 105·16 88·92	97·070 96·880 97·040	96·975 96·960	96·967	at div. 96 11 16 13,5 19 29,5 23 17,5	at div. 97 11 16 6 19 38 23 9	by div. 96 7 4,0 3 32,0	by div. 97 7 3,0 3 31,5	* 211,517
	380	Pos.	88·92 111·90 89·56 111·40	100·410 100·730 100·480	100·570 100·605	100·587	at div. 100 11 26 43,5 30 23 33 47	at div. 101 10 26 49,5 30 17 33 33,5	by div. 100 7 3,5 3 31,75	by div. 101 7 4,0 3 32,00	211·897
	381	Neg.	111·40 82·74 110·74 83·30	97·070 96·740 97·020	96·905 96·880	96·892	at div. 96 11 37 31 40 54 44 35	at div. 98 11 37 22 41 4 44 25,5	by div. 96 7 4,0 3 32,00	by div. 98 7 3,5 3 31,75	211,889
	382	Pos.	83·30 117·20 84·00 116·60	100·250 100·600 100·300	100·425 100·450	100·437	at div. 100 11 48 5,5 51 42 55 10	at div. 102 11 48 14 51 33,5 55 18,5	by div. 100 7 4,5 3 32,25	by div. 102 7 4,5 3 32,25	212,250
	383	Neg.	116·60 77·60 115·70 78·00	97·100 96·650 96·850	96·875 96·750	96·812	at div. 95 11 58 53,5 0 2 13 5 57,5	at div. 100 11 58 36 0 2 31 5 39,5	by div. 95 7 4,0 3 32,00	by div. 100 7 3,5 3 31,75	211,909
	384	Pos.	78·00 122·40 78·80 121·20	100·200 100·600 100·000	100·400 100·300	100·350	at div. 100 0 9 25,5 13 0 16 30,5	at div. 105 0 9 41 12 44 16 46,5	by div. 100 7 5,0 3 32,50	by div. 105 7 5,5 3 32,75	212,517
	385	Neg.	121·20 72·20 120·32 72·70	96·700 96·260 96·510	96·480 96·385	96·432	at div. 95 0 20 9,5 23 33,5 27 13	at div. 100 0 19 55,5 23 47,5 26 59	by div. 95 7 3,5 3 31,75	by div. 100 7 3,5 3 31,75	211,750
	386	Pos.	72·70 126·70 73·30 125·80	99·700 100·000 99·550	99·850 99·775	99·812	at div. 95 0 30 31,5 34 28,5 37 36	at div. 100 0 30 44 34 16 37 49	by div. 95 7 4,5 3 32,25	by div. 100 7 5,0 3 32,50	212,491
	387	Neg.	125·80 66·68 124·80 67·30	96·240 95·740 96·050	95·990 95·895	95·942	at div. 95 0 41 24,5 44 52,5 48 29	at div. 100 0 41 13 45 4,5 48 17,5	by div. 95 7 4,5 3 32,25	by div. 100 7 4,5 3 32,25	212,250
	388	Pos.	67·30 131·14 68·00 130·46	99·220 99·570 99·230	99·395 99·400	99·397	at div. 95 0 51 52 50 44 58 58	at div. 100 0 52 3 50 33 59 9	by div. 95 7 6,0 3 33,0	by div. 100 7 6,0 3 33,0	213,000
	389	Neg.	130·46 61·92 129·60 63·50	96·190 95·760 96·550	95·975 96·155	96·065	at div. 95 1 2 44 6 14,5 9 53	at div. 100 1 2 34,5 6 25 9 42,5	by div. 95 7 9,0 3 34,5	by div. 100 7 8,0 3 34,0	214·394
Continued.	390	Pos.	63·50 135·72 65·52 134·50	99·610 100·620 100·010	100·115 100·315	100·215	at div. 100 1 13 27 17 3 20 36	at div. 105 1 13 36,5 16 53 20 46	by div. 100 7 9,0 3 34,50	by div. 105 7 9,5 3 34,75	214,511

7th Series continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	391	Neg.	134·50 59·80 132·94 61·20	97·150 96·370 97·070	96·760 96·720	96·740	at div. 95 1 24 16 27 44 31 26	at div. 100 1 24 6,5 27 54 31 16	by div. 95 7 10,0 3 35,00	by div. 100 7 9,5 3 34,75	214,913
	392	Pos.	61·20 138·80 62·88 137·20	100·000 100·840 100·040	100·420 100·440	100·430	at div. 100 1 34 59 38 35,5 42 9,5	at div. 105 1 35 8 38 26,5 42 18,5	by div. 100 7 10,5 3 35,25	by div. 105 7 10,5 3 35,25	215,250
	393	Neg.	137·20 56·80 135·50 58·24	97·000 96·150 96·870	96·575 96·510	96·542	at div. 95 1 45 49 49 19 53 0	at div. 100 1 45 40,5 49 28 52 51	by div. 95 7 11,0 3 35,50	by div. 100 7 10,5 3 35,25	215,423
T=50·10 B=29·668	394	Pos.	58·24 141·26 60·20 139·48	99·750 100·730 99·840	100·240 100·285	100·262	at div. 100 1 56 34 2 0 10 3 45	at div. 105 1 56 42 2 0 1,5 3 53,5	by div. 100 7 11,0 3 35,50	by div. 105 7 11,5 3 35,75	215,513

8th Series.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

April 4 T=49·63 B=29·660	395	Pos.	87·66 115·22 88·00 114·80	101·440 101·610 101·400	101·525 101·505	101·515	at div. 100 10 12 9 16 7 19 32,5	at div. 102 10 12 19,5 16 56,5 19 43	by div. 100 7 23,5 3 41,75	by div. 102 7 23,5 3 41,75	221,750
	396	Neg.	114·80 80·46 114·20 81·00	97·630 97·330 97·600	97·480 97·465	97·472	at div. 96 10 23 30,5 27 0 30 54,5	at div. 98 10 23 22 27 8,5 30 46	by div. 96 7 24,0 3 42,0	by div. 98 7 24,0 3 42,0	222,000
	397	Pos.	81·00 121·50 81·90 120·70	101·250 101·700 101·300	101·475 101·500	101·487	at div. 100 10 34 27 38 21,5 41 52	at div. 102 10 34 34,5 38 14 41 59,5	by div. 100 7 25,0 3 42,5	by div. 102 7 25,0 3 42,5	222,500
	398	Neg.	120·70 74·60 119·80 75·20	97·650 97·200 97·500	97·425 97·350	97·387	at div. 96 10 45 47 49 20,5 53 10	at div. 98 10 45 41 49 27 53 4	by div. 96 7 23,0 3 41,5	by div. 98 7 23,0 3 41,5	221,500
	399	Pos.	75·20 127·00 76·00 126·12	101·100 101·500 101·060	101·300 101·280	101·290	at div. 100 10 56 46 11 0 36 4 10	at div. 105 10 57 0 11 0 22 4 24	by div. 100 7 24,0 3 42,0	by div. 105 7 24,0 3 42,0	222,000
	400	Neg.	126·12 68·80 125·10 69·50	97·460 96·950 97·300	97·205 97·125	97·175	at div. 95 11 8 3 11 33,5 15 26	at div. 100 11 7 50 11 46 15 13	by div. 95 7 23,0 3 41,5	by div. 100 7 23,0 3 41,5	221,500
Continued.	401	Pos.	69·50 132·10 70·54 131·20	100·800 101·320 100·870	101·060 101·095	101·077	at div. 100 11 19 1,5 22 48 26 24,5	at div. 105 11 19 13 22 36,5 26 36	by div. 100 7 23,0 3 41,5	by div. 105 7 23,0 3 41,5	221,500

8th SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	402	Neg.	131·20 63·40 130·00 64·30	97·300 96·700 97·150	97·000 96·925	96·962	at div. 95 11 30 14,5 33 48 37 38	at div. 100 11 30 4 33 58,5 37 27	by div. 95 7 23,5 3 41,75	by div. 100 7 23,0 3 41,50	221,652
	403	Pos.	64·30 137·00 65·70 136·20	100·650 101·350 100·950	101·000 101·150	101·075	at div. 100 11 41 16 45 2 48 39,5	at div. 105 11 41 25,5 44 52 48 49,5	by div. 100 7 23,5 3 41,75	by div. 105 7 24,0 3 42,00	221,804
	404	Neg.	136·20 58·70 135·28 59·60	97·450 96·990 97·440	97·220 97·215	97·217	at div. 95 11 52 28 56 3 59 53	at div. 100 11 52 19 56 12,5 59 44	by div. 95 7 25,0 3 42,5	by div. 100 7 25,0 3 42,5	222,500
	405	Pos.	59·60 142·40 60·80 141·48	101·000 101·600 101·140	101·300 101·370	101·335	at div. 100 0 3 31 7 17 10 55	at div. 105 0 3 39,5 7 8,5 11 3,5	by div. 100 7 24,0 3 42,0	by div. 105 7 24,0 3 42,0	222,000
T=50·83 B=29·500	406	Neg.	141·48 53·80 140·38 54·80	97·640 97·090 97·590	97·365 97·340	97·352	at div. 95 0 14 44,5 18 19 22 8,5	at div. 100 0 14 36,5 18 27,5 22 0,5	by div. 95 7 24,0 3 42,0	by div. 100 7 24,0 3 42,0	222,000
April 5 T=49·98 B=29·422	407	Pos.	98·80 103·70 99·00 103·64	101·250 101·350 101·320	101·300 101·335	101·317	at div. 101 9 53 30 57 33 10 0 54	at div. 102 9 54 1 57 3 10 1 25	by div. 101 7 24,0 3 42,0	by div. 102 7 24,0 3 42,0	222,000
	408	Neg.	103·64 90·90 103·42 91·10	97·270 97·160 97·260	97·215 97·210	97·212	at div. 97 10 4 56 8 34 12 20	at div. 98 10 4 45,5 8 44,5 12 9	by div. 97 7 24,0 3 42,00	by div. 98 7 23,5 3 41,75	221,947
	409	Pos.	91·10 111·20 91·48 110·94	101·150 101·340 101·210	101·245 101·275	101·260	at div. 101 10 16 6 19 52 23 30	at div. 102 10 16 13 19 44,5 23 37,5	by div. 101 7 24,0 3 42,00	by div. 102 7 24,5 3 42,25	222,065
	410	Neg.	110·94 83·60 110·50 83·90	97·270 97·050 97·200	97·160 97·125	97·142	at div. 97 10 27 19,5 30 1 34 43,5	at div. 98 10 27 14,5 30 6 34 38	by div. 97 7 24,0 3 42,00	by div. 98 7 23,5 3 41,75	221,965
	411	Pos.	83·90 118·10 84·40 117·80	101·000 101·250 101·100	101·125 101·175	101·150	at div. 100 10 38 24,5 42 16 45 48,5	at div. 102 10 38 33 42 8 45 57	by div. 100 7 24,0 3 42,0	by div. 102 7 24,0 3 42,0	222,000
	412	Neg.	117·80 76·72 117·20 77·14	97·260 96·960 97·170	97·110 97·065	97·087	at div. 96 10 49 42 53 16,5 57 5,5	at div. 98 10 49 35,5 53 23,5 56 59	by div. 96 7 23,5 3 41,75	by div. 98 7 23,5 3 41,75	221,750
Continued.	413	Pos.	77·14 124·80 77·84 124·48	100·970 101·320 101·160	101·145 101·240	101·192	at div. 100 11 0 43,5 4 33 8 7,5	at div. 105 11 0 58,5 4 17,5 8 22,5	by div. 100 7 24,0 3 42,0	by div. 105 7 24,0 3 42,0	222,000

8th Series continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	414	Neg.	124·48 70·40 123·92 70·90	97·440 97·160 97·410	97·300 97·285	97·292	at div. 95 11 12 1 15 31,5 19 25,5	at div. 100 11 11 48 15 45 19 12,5	by div. 95 7 24,5 3 42,25	by div. 100 7 24,5 3 42,25	222,250
	415	Pos.	70·90 131·48 71·70 130·94	101·190 101·590 101·320	101·390 101·455	101·422	at div. 100 11 23 0,5 26 49 30 24	at div. 105 11 23 12 26 37 30 36	by div. 100 7 23,5 3 41,75	by div. 105 7 24,0 3 42,00	221,821
	416	Neg.	130·94 64·40 130·20 65·10	97·670 97·300 97·650	97·485 97·475	97·480	at div. 95 11 34 17 37 48,5 41 41,5	at div. 100 11 34 6 37 59,5 41 30,5	by div. 95 7 24,5 3 42,25	by div. 100 7 24,5 3 42,25	222,250
	417	Pos.	65·10 137·50 66·30 136·72	101·300 101·900 101·510	101·600 101·705	101·652	at div. 100 11 45 17,5 49 6 52 42	at div. 105 11 45 27 48 56 52 52	by div. 100 7 24,5 3 42,25	by div. 105 7 25,0 3 42,50	222,333
T = 50·31 B = 29·440	418	Neg.	136·72 59·20 135·70 60·28	97·960 97·450 97·990	97·705 97·720	97·712	at div. 95 11 56 34 0 0 7 3 58	at div. 100 11 56 25 0 0 16 3 49	by div. 95 7 24,0 3 42,0	by div. 100 7 24,0 3 42,0	222,000
April 6 T = B =	419	Pos.	98·90 104·40 99·00 104·30	101·650 101·700 101·650	101·675 101·675	101·675	at div. 101 7 14 47 19 8 22 10	at div. 102 7 15 14 18 40 22 38	by div. 101 7 23,0 3 41,5	by div. 102 7 24,0 3 42,0	221,837
	420	Neg.	104·30 91·00 104·10 91·24	97·650 97·550 97·670	97·600 97·610	97·605	at div. 97 7 26 16 29 44 33 39	at div. 98 7 26 5 29 55 33 28	by div. 97 7 23,0 3 41,5	by div. 98 7 23,0 3 41,5	221,500
	421	Pos.	91·24 111·90 91·70 111·60	101·570 101·800 101·650	101·685 101·725	101·705	at div. 101 7 37 18 41 9,5 44 41	at div. 102 7 37 25 41 2,5 44 48	by div. 101 7 23,0 3 41,5	by div. 102 7 23,0 3 41,5	221,500
	422	Neg.	111·60 83·90 111·12 84·20	97·750 97·510 97·660	97·630 97·585	97·607	at div. 97 7 48 35,5 52 11 55 59,5	at div. 98 7 48 30 52 16 55 54	by div. 97 7 24,0 3 42,0	by div. 98 7 24,0 3 42,0	222,000
	423	Pos.	84·20 118·80 84·78 118·40	101·500 101·790 101·590	101·645 101·690	101·667	at div. 100 7 59 35 8 3 30,5 6 58,5	at div. 102 7 59 43 8 3 22,5 7 7	by div. 100 7 23,5 3 41,75	by div. 102 7 24,0 3 42,00	221,958
	424	Neg.	118·40 77·20 117·80 77·60	97·800 97·500 97·700	97·650 97·600	97·625	at div. 96 8 10 55 14 26 18 18,5	at div. 98 8 10 48,5 14 33 18 12	by div. 96 7 23,5 3 41,75	by div. 98 7 23,5 3 41,75	221,750
			After an	interval masses	of about having	an hour remained	and a half, I re on the negative	sumed the ex side.	periments:	the	

8th SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	425	Neg.	112·20 83·00 111·86 83·40	97·600 97·430 97·630	97·515 97·530	97·522	at div. 96 9 54 34 58 2 10 2 0	at div. 98 9 54 24 58 12 10 1 50	by div. 96 7 26,0 3 43,0	by div. 98 7 26,0 3 43,0	• 223·000
	426	Pos.	83·40 119·68 84·00 119·32	101·540 101·840 101·660	101·690 101·750	101·720	at div. 100 10 5 32 9 28,5 12 57	at div. 102 10 5 40 9 20,5 13 5	by div. 100 7 25,0 3 42,5	by div. 102 7 25,0 3 42,5	222·500
	427	Neg.	119·32 76·60 118·70 77·18	97·960 97·650 97·940	97·805 97·795	97·800	at div. 95 10 17 0 20 25 24 26	at div. 100 10 16 43,5 20 41,5 24 9	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	222·860
	428	Pos.	77·18 126·26 78·08 125·70	101·720 102·170 101·890	101·945 102·030	101·987	at div. 100 10 27 58 31 52 35 23	at div. 105 10 28 12,5 31 37 35 38	by div. 100 7 25,0 3 42,50	by div. 105 7 25,5 3 42,75	222·599
	429	Neg.	125·70 70·60 125·00 71·40	98·150 97·800 98·200	97·975 98·000	97·987	at div. 95 10 39 22 42 49 46 48	at div. 100 10 39 9 43 2 46 34,5	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	222·851
	430	Pos.	71·40 132·42 72·26 131·80	101·910 102·340 102·030	102·125 102·185	102·155	at div. 100 10 50 20,5 54 13 57 45,5	at div. 105 10 50 32 54 1,5 57 57,5	by div. 100 7 25,0 3 42,50	by div. 105 7 25,5 3 42,75	222·608
	431	Neg.	131·80 64·90 130·90 65·80	98·350 97·900 98·350	98·125 98·125	98·125	at div. 95 11 1 41,5 5 11,5 9 7	at div. 100 11 1 31 5 22 8 56,5	by div. 95 7 25,5 3 42,75	by div. 100 7 25,5 3 42,75	222·750
	432	Pos.	65·80 138·20 66·80 137·32	102·000 102·500 102·060	102·250 102·280	102·265	at div. 100 11 12 40 16 31,5 20 5	at div. 105 11 12 50 16 21,5 20 15	by div. 100 7 25,0 3 42,5	by div. 105 7 25,0 3 42,5	222·500
	433	Neg.	137·32 59·72 136·30 60·70	98·520 98·010 98·500	98·265 98·255	98·260	at div. 95 11 24 0 27 31 31 26	at div. 100 11 23 51 27 40 31 16,5	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	222·837
	434	Pos.	60·70 143·34 62·00 142·20	102·020 102·670 102·100	102·345 102·385	102·365	at div. 100 11 35 0,5 38 52 42 26	at div. 105 11 35 9 38 43 42 35	by div. 100 7 25,5 3 42,75	by div. 105 7 26,0 3 43,00	222·868
	435	Neg.	142·20 55·00 140·94 56·12	98·600 97·970 98·530	98·285 98·250	98·267	at div. 95 11 46 20 49 53 53 46	at div. 100 11 46 12,5 50 1 53 38	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	222,837
Continued.	436	Pos.	56·12 147·92 57·60 146·74	102·020 102·760 102·170	102·390 102·465	102·427	at div. 100 11 57 22 0 1 12,5 4 47,5	at div. 105 11 57 29,5 0 1 4,5 4 55,5	by div. 100 7 25,5 3 42,75	by div. 105 7 26,0 3 43,00	222·871

6th SERIES continued.— 1½-inch *Platina* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	319	Neg.	149·00 55·30 144·60 59·72	102·150 99·950 102·160	101·050 101·055	101·052	at div. 100 10 56 5 11 3 36 11 17	at div. 105 10 55 49,5 11 3 52 11 0	by div. 100 15 12,0 7 36,00	by div. 105 15 10,5 7 35,25	* 455,842
	320	Pos.	59·72 171·30 63·84 166·00	115·510 117·570 114·920	116·540 116·245	116·392	at div. 115 11 18 51,5 26 28 33 57	at div. 120 11 19 4,5 26 14,5 34 11,5	by div. 115 15 5,5 7 32,75	by div. 120 15 7,0 7 33,50	452,959
	321	Neg.	166·00 35·80 160·80 41·10	100·900 98·300 100·950	99·600 96·625	99·612	at div. 95 11 41 44 48 56 56 48,5	at div. 100 11 41 33 49 7,5 56 36,5	by div. 95 15 4,5 7 32,25	by div. 100 15 3,5 7 31,75	451,789
	322	Pos.	41·10 185·80 44·80 180·10	113·450 115·300 112·450	114·375 113·875	114·125	at div. 110 0 4 2,5 missed. 18 58	at div. 115 0 4 12,5 missed. 19 8,5	by div. 110 14 55,5 7 27,75	by div. 115 14 56,0 7 28,00	447,956
	323	Neg.	180·10 15·70 174·50 18·80	97·900 95·100 96·650	96·500 95·875	96·187	at div. 95 0 26 39 34 5,5 41 43	at div. 100 0 26 30 34 11,5 41 33,5	by div. 95 15 4,0 7 32,00	by div. 100 15 3,5 7 31,75	451,941
T = 52·85 B = 29·950	324	Pos.	18·80 201·70 24·80 195·20	110·250 113·250 110·000	111·750 111·625	111·687	at div. 110 0 49 21,5 57 11 1 4 52,5	at div. 115 0 49 29,5 57 3 1 5 1	by div. 110 15 31,0 7 45,50	by div. 115 15 31,5 7 45,75	465,584
March 30 T = 52·71 B = 29·924	325	Neg.	103·80 87·12 102·80 87·90	95·460 94·960 95·350	95·210 95·155	95·182	at div. 95 9 51 15,5 58 43 10 6 21,5	at div. 96 9 50 58 59 2 10 6 2	by div. 95 15 6,0 7 33,0	by div. 96 15 4,0 7 32,0	452,818
	326	Pos.	87·90 134·40 89·96 132·30	111·150 112·180 111·130	111·665 111·655	111·660	at div. 111 10 13 53 21 34 28 59	at div. 112 10 13 59 21 27 29 6	by div. 111 15 6,0 7 33,0	by div. 112 15 7,0 7 33,5	453,330
	327	Neg.	132·30 59·50 128·94 62·90	95·900 94·220 95·920	95·060 95·070	95·065	at div. 94 10 36 48 44 16 51 59	at div. 96 10 36 40 44 24 51 50,5	by div. 94 15 11,0 7 35,50	by div. 96 15 10,5 7 35,25	455,367
	328	Pos.	62·90 158·12 66·84 154·50	110·510 112·480 110·670	111·495 111·575	111·535	at div. 110 10 59 31 11 7 14 14 38,5	at div. 115 10 59 46 11 6 58 14 55	by div. 110 15 7,5 7 33,75	by div. 115 15 9,0 7 34,50	453,980
	329	Neg.	154·50 37·70 149·76 41·20	96·100 93·730 95·480	94·915 94·605	94·760	at div. 90 11 22 31,5 29 40,5 37 36,5	at div. 95 11 22 19 29 53 37 23	by div. 90 15 5,0 7 32,5	by div. 95 15 4,0 7 32,0	452,024
T = 52·80 B = 29·950	330	Pos.	41·20 177·92 45·70 172·90	109·560 111·810 109·300	110·685 110·555	110·620	at div. 110 11 44 58,5 52 39 0 0 13,5	at div. 115 11 45 9 52 28 0 0 25	by div. 110 15 15,0 7 37,5	by div. 115 15 16,0 7 38,0	457,562

7th SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
March 31 T = 52·60 B = 29·672	331	Neg.	98·40 94·34 98·20 94·40	96·370 96·270 96·300	96·320 96·285	96·302	at div. 96 10 26 17 29 30 33 23	at div. 97 10 25 43 30 6 32 47	by div. 96 7 6,0 3 33,0	by div. 97 7 4,0 3 32,0	* 212,698
	332	Pos.	94·40 105·34 94·72 105·20	99·870 100·030 99·960	99·950 99·995	99·972	at div. 99 10 36 43 40 40 43 48	at div. 100 10 36 56 40 27 44 1	by div. 99 7 5,0 3 32,5	by div. 100 7 5,0 3 32,5	212,500
	333	Neg.	105·20 87·66 104·80 88·00	96·430 96·230 96·400	96·330 96·315	96·322	at div. 96 10 47 41 51 9 54 46,5	at div. 97 10 47 33 51 17 54 38	by div. 96 7 5,5 3 32,75	by div. 97 7 5,0 3 32,50	212,670
	334	Pos.	88·00 111·52 88·60 111·02	99·760 100·060 99·810	99·910 99·935	99·922	at div. 99 10 58 17 11 2 1,5 5 23	at div. 100 10 58 23 11 1 56 5 29,5	by div. 99 7 6,0 3 33,00	by div. 100 7 6,5 3 33,25	213,230
	335	Neg.	111·02 81·70 110·40 82·28	96·360 96·050 96·340	96·205 96·195	96·200	at div. 96 11 9 3 12 37 16 12	at div. 97 11 8 58 12 42 16 7	by div. 96 7 9,0 3 34,5	by div. 97 7 9,0 3 34,5	214,500
	336	Pos.	82·28 116·96 83·02 116·30	99·620 99·990 99·660	99·805 99·825	99·815	at div. 98 11 19 42 23 30 26 38	at div. 100 11 19 50 23 21,5 26 46	by div. 98 6 56,0 3 28,0	by div. 100 6 56,0 3 28,0	208,000
	337	Neg.	116·30 76·32 115·48 77·00	96·310 95·900 96·240	96·105 96·070	96·087	at div. 96 11 30 32 34 5 37 37,5	at div. 98 11 30 25 34 12 37 30,5	by div. 96 7 5,5 3 32,75	by div. 98 7 5,5 3 32,75	212,750
	338	Pos.	77·00 122·08 77·90 121·30	99·540 99·990 99·600	99·765 99·795	99·780	at div. 98 11 41 9 44 53 48 16	at div. 100 11 41 15 44 47,5 48 22	by div. 98 7 7,0 3 33,5	by div. 100 7 7,0 3 33,5	213,500
	339	Neg.	121·30 71·40 120·50 72·30	96·350 95·950 96·400	96·150 96·175	96·162	at div. 96 11 51 57 55 30,5 59 5	at div. 98 11 51 51,5 55 36 58 59,5	by div. 96 7 8,0 3 34,0	by div. 98 7 8,0 3 34,0	214,000
	340	Pos.	72·30 127·06 73·50 126·30	99·680 100·280 99·900	99·980 100·090	100·035	at div. 100 0 2 41 6 15 9 49	at div. 102 0 2 46 6 10 9 54	by div. 100 7 8,0 3 34,0	by div. 102 7 8,0 3 34,0	214,000
	341	Neg.	126·30 67·28 125·40 68·40	96·790 96·340 96·900	96·565 96·620	96·592	at div. 96 0 13 26 16 57,5 20 35	at div. 98 0 13 21,5 17 2,5 20 30	by div. 96 7 9,0 3 34,50	by div. 98 7 8,5 3 34,25	214,426
T = 52·80 B = 29·640	342	Pos.	68·40 131·70 69·90 130·60	100·050 100·800 100·250	100·425 100·525	100·475	at div. 100 0 21 10 27 47 31 19	at div. 102 0 21 14,5 27 42 31 23,5	by div. 100 7 9,0 3 34,5	by div. 102 7 9,0 3 34,5	214,500

7th SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
April 1 T=51·30 B=29·662	343	Pos.	97·80 101·60 97·90 101·50	99·700 99·750 99·700	99·725 99·725	99·725	at div. 99 9 46 29 50 52 53 31	at div. 100 9 47 4 50 16 54 9	by div. 99 7 2,0 3 31,0	by div. 100 7 5,0 3 32,5	* 212,087
	344	Neg.	101·50 90·72 101·26 91·00	96·110 95·990 96·130	96·050 96·060	96·055	at div. 96 9 57 43 10 1 14,5 4 48	at div. 97 9 57 31 10 1 27 4 35	by div. 96 7 5,0 3 32,5	by div. 97 7 4,0 3 32,0	212,473
	345	Pos.	91·00 108·18 91·68 107·88	99·590 99·930 99·780	99·760 99·855	99·807	at div. 99 10 8 22 12 7,5 15 26	at div. 100 10 8 30 11 59 15 34	by div. 99 7 4,0 3 32,0	by div. 100 7 4,0 3 32,0	212,000
	346	Neg.	107·88 84·90 107·20 85·40	96·390 96·050 96·300	96·220 96·175	96·197	at div. 96 10 19 13 22 43 26 18	at div. 97 10 19 7 22 49,5 26 12	by div. 96 7 5,0 3 32,5	by div. 97 7 5,0 3 32,5	212,500
	347	Pos.	85·40 113·82 86·30 113·20	99·610 100·060 99·750	99·835 99·905	99·870	at div. 98 10 29 45,5 33 37 36 50,5	at div. 100 10 29 55 33 27 37 0,5	by div. 98 7 5,0 3 32,50	by div. 100 7 5,5 3 32,75	212,734
	348	Neg.	113·20 79·70 112·40 80·12	96·450 96·050 96·260	96·250 96·155	96·202	at div. 96 10 40 36 44 7 47 41,5	at div. 98 10 40 28 44 15,5 47 33	by div. 96 7 5,5 7 32,75	by div. 98 7 5,0 7 32,50	212,725
	349	Pos.	80·12 119·10 81·30 118·10	99·610 100·200 99·700	99·905 99·950	99·927	at div. 95 10 50 56 55 7 58 3	at div. 100 10 51 15 54 48,5 58 22	by div. 95 7 7,0 3 33,5	by div. 100 7 7,0 3 33,5	213,500
	350	Neg.	118·10 74·74 117·40 75·60	96·420 96·070 96·500	96·245 96·285	96·265	at div. 95 11 2 0 5 25,5 9 5,5	at div. 100 11 1 44,5 5 41,5 8 49,5	by div. 95 7 5,5 3 32,75	by div. 100 7 5,0 3 32,50	212,687
	351	Pos.	75·60 123·50 76·50 122·70	99·550 100·000 99·600	99·775 99·800	99·787	at div. 95 11 12 23 16 23 19 27,5	at div. 100 11 12 37 16 9 19 42,5	by div. 95 7 4,5 3 32,25	by div. 100 7 5,5 3 32,75	212,729
	352	Neg.	122·70 69·94 121·78 70·70	96·320 95·860 96·240	96·090 96·050	96·070	at div. 95 11 23 19 26 46 30 24	at div. 100 11 23 6 26 59 30 11	by div. 95 7 5,0 3 32,5	by div. 100 7 5,0 3 32,5	212,500
	353	Pos.	70·70 128·20 71·52 127·52	99·450 99·860 99·520	99·655 99·690	99·672	at div. 95 11 33 45 37 40,5 40 50	at div. 100 11 33 57 37 28 41 2,5	by div. 95 7 5,0 3 32,50	by div. 100 7 5,5 3 32,75	212,734
T=51·41 B=29·676	354	Neg.	127·52 65·30 126·30 66·02	96·410 95·800 96·160	96·105 95·980	96·042	at div. 95 11 44 40,5 48 9 51 46	at div. 100 11 44 29,5 48 20 51 35	by div. 95 7 5,5 3 32,75	by div. 100 7 5,5 3 32,75	212,750

7th Series continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times. h m s	 h m s	2 N m s	 m s	N for Mean Resting Point.
April 2 T=50·80 B=29·670	355	Neg.	99·20 94·80 99·00 95·00	97·000 96·900 97·000	96·950 96·950	96·950	at div. 96 9 50 27 52 58 57 33	at div. 97 9 49 55 53 31 56 59	by div. 96 7 6,0 3 33,0	by div. 97 7 4,0 3 32,0	212,050
	356	Pos.	95·00 106·10 95·30 105·84	100·550 100·700 100·570	100·625 100·635	100·630	at div. 100 10 0 29,5 4 17 7 35	at div. 101 10 0 42 4 4 7 48	by div. 100 7 5,5 3 32,75	by div. 101 7 6,0 3 33,00	212,907
	357	Neg.	105·84 88·20 105·44 87·34	97·020 96·820 96·390	96·920 96·605	96·762	at div. 96 10 11 31 14 50 18 37	at div. 97 10 11 23 14 58 18 29	by div. 96 7 6,0 3 33,0	by div. 97 7 6,0 3 33,0	213,000
	358	Pos.	87·34 112·30 88·88 111·92	99·820 100·590 100·400	100·205 100·495	100·350	at div. 100 10 22 6 25 44 29 11	at div. 101 10 22 11 25 38,5 29 17	by div. 100 7 5,0 3 32,5	by div. 101 7 6,0 3 33,0	212,675
	359	Neg.	111·92 81·88 111·32 82·30	96·900 96·600 96·810	96·750 96·705	96·727	at div. 96 10 32 54 36 20 40 0	at div. 98 10 32 45 36 29,5 39 50,5	by div. 96 7 6,0 3 33,00	by div. 98 7 5,5 3 32,75	212,909
	360	Pos.	82·30 117·90 82·86 117·40	100·100 100·380 100·130	100·240 100·255	100·247	at div. 100 10 43 31,5 47 7,5 50 38,5	at div. 102 10 43 39,5 47 0 50 46,5	by div. 100 7 7,0 3 33,5	by div. 102 7 7,0 3 33,5	213,500
	361	Neg.	117·40 76·00 116·70 76·50	96·700 96·350 96·600	96·525 96·475	96·500	at div. 95 10 54 20 57 43 11 1 26	at div. 100 10 54 4 58 0 11 1 9	by div. 95 7 6,0 3 33,0	by div. 100 7 5,0 3 32,5	212,850
	362	Pos.	76·50 123·36 77·10 122·74	99·930 100·230 99·920	100·080 100·075	100·077	at div. 100 11 4 56,5 8 30 12 3	at div. 105 11 5 11 8 16 12 18	by div. 100 7 6,5 3 33,25	by div. 105 7 7,0 3 33,50	213,254
	363	Neg.	122·74 70·40 122·10 70·90	96·570 96·250 96·500	96·410 96·375	96·392	at div. 95 11 15 42,5 19 8 22 49	at div. 100 11 15 29,5 19 22 22 36	by div. 95 7 6,5 3 33,25	by div. 100 7 6,5 3 33,25	213,250
	364	Pos.	70·90 128·70 71·90 128·00	99·800 100·300 99·950	100·050 100·125	100·087	at div. 100 11 26 21 29 55 33 28	at div. 105 11 26 32,5 29 43 33 40	by div. 100 7 7,0 3 33,50	by div. 105 7 7,5 3 33,75	213,504
	365	Neg.	128·00 65·50 127·22 66·72	96·750 96·360 96·970	96·555 96·665	96·610	at div. 95 11 37 7 40 34,5 44 16	at div. 100 11 36 56 40 45,5 44 5	by div. 95 7 9,0 3 34,5	by div. 100 7 9,0 3 34,5	214,500
Continued.	366	Pos.	66·72 133·70 68·18 132·60	100·210 100·940 100·390	100·575 100·665	100·620	at div. 100 11 47 48 51 24,5 54 57	at div. 105 11 47 58 51 14,5 55 7,5	by div. 100 7 9,0 3 34,50	by div. 105 7 9,5 3 34,75	214,531

7th Series continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean	3rd Mean, or Resting Point	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	367	Neg.	132·60 61·96 131·32 63·28	97·280 96·640 97·300	96·960 96·970	96·965	at div. 95 11 58 38 0 2 5,5 5 48	at div. 100 11 58 28,5 0 2 15 5 38	by div. 95 7 10,0 3 35,00	by div. 100 7 9,5 3 34,75	214,902
	368	Pos.	63·28 137·38 64·84 135·90	100·330 101·110 100·370	100·720 100·740	100·730	at div. 100 0 9 20 12 58 16 30,5	at div. 105 0 9 29 12 48,5 16 40	by div. 100 7 10,5 3 35,25	by div. 103 7 11,0 3 35,50	215,286
	369	Neg.	135·90 58·70 134·40 60·10	97·300 96·550 97·250	96·925 96·900	96·912	at div. 95 0 20 12 23 40,5 27 23	at div. 100 0 20 3 23 49,5 27 13,5	by div. 95 7 11,0 3 35,50	by div. 100 7 10,5 3 35,25	215,404
	370	Pos.	60·10 140·34 61·60 138·80	100·220 100·970 100·200	100·595 100·585	100·590	at div. 100 0 30 54,5 34 32 38 5,5	at div. 105 0 31 3 34 23,5 38 14	by div. 100 7 11,0 3 35,5	by div. 105 7 11,0 3 35,5	215,500
	371	Neg.	138·80 53·68 137·18 57·20	97·240 96·430 97·190	96·835 96·810	96·822	at div. 95 0 41 46 45 15,5 48 57	at div. 100 0 41 37,5 45 24 48 48,5	by div. 93 7 11,0 3 35,3	by div. 100 7 11,0 3 35,5	215,300
	372	Pos.	57·20 143·00 59·08 141·30	100·100 101·040 100·190	100·570 100·613	100·392	at div. 100 0 52 30 56 8 39 41	at div. 105 0 52 38 55 59,5 59 49,5	by div. 100 7 11,0 3 35,50	by div. 105 7 11,5 3 35,75	213,530
	373	Neg.	141·30 53·30 139·40 35·00	97·300 96·350 97·200	96·825 96·775	96·800	at div. 93 1 3 21 6 51 10 32,5	at div. 100 1 3 13,5 6 39 10 24,5	by div. 95 7 11,5 3 35,75	by div. 100 7 11,0 3 33,50	215,660
	374	Pos.	55·00 145·00 57·10 143·20	100·000 101·050 100·150	100·525 100·600	100·562	at div. 100 1 14 5,5 17 43 21 16,5	at div. 105 1 14 13 17 35 21 24,5	by div. 100 7 11,0 3 35,50	by div. 105 7 11,5 3 35,75	215,528
	375	Neg.	143·20 31·70 140·84 53·80	97·450 96·270 97·320	96·860 96·795	96·827	at div. 95 1 24 58 28 28 32 9,5	at div. 100 1 24 51 28 36 32 2	by div. 95 7 11,5 3 35,75	by div. 100 7 11,0 3 35,50	215,659
T = 51·27 B = 29·700	376	Pos.	53·80 146·30 55·90 144·28	100·050 101·100 100·090	100·575 100·595	100·585	at div. 100 1 35 42,5 39 20 42 34	at div. 105 1 35 50 39 12 43 2	by div. 100 7 11,5 3 35,75	by div. 105 7 12,0 3 36,00	215,779
April 3 T = 49·33 B = 29·710	377	Neg.	98·74 95·20 98·64 95·30	96·970 96·920 96·970	96·945 96·945	96·945	at div. 96 10 55 16 missed. 11 2 22	at div. 97 10 54 35 58 14 11 1 40	by div. 96 7 6,0 3 33,0	by div. 97 7 5,0 3 32,3	212,528
Continued.	378	Pos.	95·30 105·80 95·60 105·54	100·550 100·700 100·570	100·625 100·635	100·630	at div. 100 11 3 17 9 6 12 20,5	at div. 101 11 5 30,5 8 52,3 12 34	by div. 100 7 3,5 3 31,75	by div. 101 7 3,5 3 31,75	211,750

7th SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	379	Neg.	105·54 88·60 105·16 88·92	97·070 96·880 97·040	96·975 96·960	96·967	at div. 96 11 16 13,5 19 29,5 23 17,5	at div. 97 11 16 6 19 38 23 9	by div. 96 7 4,0 3 32,0	by div. 97 7 3,0 3 31,5	211,517
	380	Pos.	88·92 111·90 89·56 111·40	100·410 100·730 100·480	100·570 100·605	100·587	at div. 100 11 26 43,5 30 23 33 47	at div. 101 10 26 49,5 30 17 33 33,5	by div. 100 7 3,5 3 31,75	by div. 101 7 4,0 3 32,00	211·897
	381	Neg.	111·40 82·74 110·74 83·30	97·070 96·740 97·020	96·905 96·880	96·892	at div. 96 11 37 31 40 54 44 35	at div. 98 11 37 22 41 4 44 25,5	by div. 96 7 4,0 3 32,00	by div. 98 7 3,5 3 31,75	211,889
	382	Pos.	83·30 117·20 84·00 116·60	100·250 100·600 100·300	100·425 100·450	100·437	at div. 100 11 48 5,5 51 42 55 10	at div. 102 11 48 14 51 33,5 55 18,5	by div. 100 7 4,5 3 32,25	by div. 102 7 4,5 3 32,25	212,250
	383	Neg.	116·60 77·60 115·70 78·00	97·100 96·650 96·850	96·875 96·750	96·812	at div. 95 11 58 53,5 0 2 13 5 57,5	at div. 100 11 58 36 0 2 31 5 39,5	by div. 95 7 4,0 3 32,00	by div. 100 7 3,5 3 31,75	211,909
	384	Pos.	78·00 122·40 78·80 121·20	100·200 100·600 100·000	100·400 100·300	100·350	at div. 100 0 9 25,5 13 0 16 30,5	at div. 105 0 9 41 12 44 16 46,5	by div. 100 7 5,0 3 32,50	by div. 105 7 5,5 3 32,75	212,517
	385	Neg.	121·20 72·20 120·32 72·70	96·700 96·260 96·510	96·480 96·385	96·432	at div. 95 0 20 9,5 23 33,5 27 13	at div. 100 0 19 55,5 23 47,5 26 59	by div. 95 7 3,5 3 31,75	by div. 100 7 3,5 3 31,75	211,750
	386	Pos.	72·70 126·70 73·30 125·80	99·700 100·000 99·550	99·850 99·775	99·812	at div. 95 0 30 31,5 34 28,5 37 36	at div. 100 0 30 44 34 16 37 49	by div. 95 7 4,5 3 32,25	by div. 100 7 5,0 3 32,50	212,491
	387	Neg.	125·80 66·68 124·80 67·30	96·240 95·740 96·050	95·990 95·895	95·942	at div. 95 0 41 24,5 44 52,5 48 29	at div. 100 0 41 13 45 4,5 48 17,5	by div. 95 7 4,5 3 32,25	by div. 100 7 4,5 3 32,25	212,250
	388	Pos.	67·30 131·14 68·00 130·46	99·220 99·570 99·230	99·395 99·400	99·397	at div. 95 0 51 52 50 44 58 58	at div. 100 0 52 3 50 33 59 9	by div. 95 7 6,0 3 33,0	by div. 100 7 6,0 3 33,0	213,000
	389	Neg.	130·46 61·92 129·60 63·50	96·190 95·760 96·550	95·975 96·155	96·065	at div. 95 1 2 44 6 14,5 9 53	at div. 100 1 2 34,5 6 25 9 42,5	by div. 95 7 9,0 3 34,5	by div. 100 7 8,0 3 34,0	214·394
Continued.	390	Pos.	63·50 135·72 65·52 134·50	99·610 100·620 100·010	100·115 100·315	100·215	at div. 100 1 13 27 17 3 20 36	at div. 105 1 13 36,5 16 53 20 46	by div. 100 7 9,0 3 34,50	by div. 105 7 9,5 3 34,75	214,511

7th SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	391	Neg.	134·50 59·80 132·94 61·20	97·150 96·370 97·070	96·760 96·720	96·740	at div. 95 1 24 16 27 44 31 26	at div. 100 1 24 6,5 27 54 31 16	by div. 95 7 10,0 3 35,00	by div. 100 7 9,5 3 34,75	214,913
	392	Pos.	61·20 138·80 62·88 137·20	100·000 100·840 100·040	100·420 100·440	100·430	at div. 100 1 34 59 38 35,5 42 9,5	at div. 105 1 35 8 38 26,5 42 18,5	by div. 100 7 10,5 3 35,25	by div. 105 7 10,5 3 35,25	215,250
	393	Neg.	137·20 56·80 135·50 58·24	97·000 96·150 96·870	96·575 96·510	96·542	at div. 95 1 45 49 49 19 53 0	at div. 100 1 45 40,5 49 28 52 51	by div. 95 7 11,0 3 35,50	by div. 100 7 10,5 3 35,25	215,423
T = 50·10 B = 29·668	394	Pos.	58·24 141·26 60·20 139·48	99·750 100·730 99·840	100·240 100·285	100·262	at div. 100 1 56 34 2 0 10 3 45	at div. 105 1 56 42 2 0 1,5 3 53,5	by div. 100 7 11,0 3 35,50	by div. 105 7 11,5 3 35,75	215,513

8th SERIES.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

April 4 T = 49·63 B = 29·660	395	Pos.	87·66 115·22 88·00 114·80	101·440 101·610 101·400	101·525 101·505	101·515	at div. 100 10 12 9 16 7 19 32,5	at div. 102 10 12 19,5 16 56,5 19 43	by div. 100 7 23,5 3 41,75	by div. 102 7 23,5 3 41,75	221,750
	396	Neg.	114·80 80·46 114·20 81·00	97·630 97·330 97·600	97·480 97·465	97·472	at div. 96 10 23 30,5 27 0 30 54,5	at div. 98 10 23 22 27 8,5 30 46	by div. 96 7 24,0 3 42,0	by div. 98 7 24,0 3 42,0	222,000
	397	Pos.	81·00 121·50 81·90 120·70	101·250 101·700 101·300	101·475 101·500	101·487	at div. 100 10 34 27 38 21,5 41 52	at div. 102 10 34 34,5 38 14 41 59,5	by div. 100 7 25,0 3 42,5	by div. 102 7 25,0 3 42,5	222,500
	398	Neg.	120·70 74·60 119·80 75·20	97·650 97·200 97·500	97·425 97·350	97·387	at div. 96 10 45 47 49 20,5 53 10	at div. 98 10 45 41 49 27 53 4	by div. 96 7 23,0 3 41,5	by div. 98 7 23,0 3 41,5	221,500
	399	Pos.	75·20 127·00 76·00 126·12	101·100 101·500 101·060	101·300 101·280	101·290	at div. 100 10 56 46 11 0 36 4 10	at div. 105 10 57 0 11 0 22 4 24	by div. 100 7 24,0 3 42,0	by div. 105 7 24,0 3 42,0	222,000
	400	Neg.	126·12 68·80 125·10 69·50	97·460 96·950 97·300	97·205 97·125	97·175	at div. 95 11 8 3 11 33,5 15 26	at div. 100 11 7 50 11 46 15 13	by div. 95 7 23,0 3 41,5	by div. 100 7 23,0 3 41,5	221,500
Continued.	401	Pos.	69·50 132·10 70·54 131·20	100·800 101·320 100·870	101·060 101·095	101·077	at div. 100 11 19 1,5 22 48 26 24,5	at div. 105 11 19 13 22 36,5 26 36	by div. 100 7 23,0 3 41,5	by div. 105 7 23,0 3 41,5	221,500

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	402	Neg.	131·20 63·40 130·00 64·30	97·300 96·700 97·150	97·000 96·925	96·962	at div. 95 11 30 14,5 33 48 37 38	at div. 100 11 30 4 33 58,5 37 27	by div. 95 7 23,5 3 41,75	by div. 100 7 23,0 3 41,50	221,652
	403	Pos.	64·30 137·00 65·70 136·20	100·650 101·350 100·950	101·000 101·150	101·075	at div. 100 11 41 16 45 2 48 39,5	at div. 105 11 41 25,5 44 52 48 49,5	by div. 100 7 23,5 3 41,75	by div. 105 7 24,0 3 42,06	221,804
	404	Neg.	136·20 58·70 135·28 59·60	97·450 96·990 97·440	97·220 97·215	97·217	at div. 95 11 52 28 56 3 59 53	at div. 100 11 52 19 56 12,5 59 44	by div. 95 7 25,0 3 42,5	by div. 100 7 25,0 3 42,5	222,500
	405	Pos.	59·60 142·40 60·80 141·48	101·000 101·600 101·140	101·300 101·370	101·335	at div. 100 0 3 31 7 17 10 55	at div. 105 0 3 39,5 7 8,5 11 3,5	by div. 100 7 24,0 3 42,0	by div. 105 7 24,0 3 42,0	222,000
T = 50·83 B = 29·500	406	Neg.	141·48 53·80 140·38 54·80	97·640 97·090 97·590	97·365 97·340	97·352	at div. 95 0 14 44,5 18 19 22 8,5	at div. 100 0 14 36,5 18 27,5 22 0,5	by div. 95 7 24,0 3 42,0	by div. 100 7 24,0 3 42,0	222,000
April 5 T=49·98 B=29·422	407	Pos.	98·80 103·70 99·00 103·64	101·250 101·350 101·320	101·300 101·335	101·317	at div. 101 9 53 30 57 33 10 0 54	at div. 102 9 54 1 57 3 10 1 25	by div. 101 7 24,0 3 42,0	by div. 102 7 24,0 3 42,0	222,000
	408	Neg.	103·64 90·90 103·42 91·10	97·270 97·160 97·260	97·215 97·210	97·212	at div. 97 10 4 56 8 34 12 20	at div. 98 10 4 45,5 8 44,5 12 9	by div. 97 7 24,0 3 42,00	by div. 98 7 23,5 3 41,75	221,947
	409	Pos.	91·10 111·20 91·48 110·94	101·150 101·340 101·210	101·245 101·275	101·260	at div. 101 10 16 6 19 52 23 30	at div. 102 10 16 13 19 44,5 23 37,5	by div. 101 7 24,0 3 42,00	by div. 102 7 24,5 3 42,25	222,065
	410	Neg.	110·94 83·60 110·50 83·90	97·270 97·050 97·200	97·160 97·125	97·142	at div. 97 10 27 19,5 30 1 34 43,5	at div. 98 10 27 14,5 30 6 34 38	by div. 97 7 24,0 3 42,00	by div. 98 7 23,5 3 41,75	221,965
	411	Pos.	83·90 118·10 84·40 117·80	101·000 101·250 101·100	101·125 101·175	101·150	at div. 100 10 38 24,5 42 16 45 48,5	at div. 102 10 38 33 42 8 45 57	by div. 100 7 24,0 3 42,0	by div. 102 7 24,0 3 42,0	222,000
	412	Neg.	117·80 76·72 117·20 77·14	97·260 96·960 97·170	97·110 97·065	97·087	at div. 96 10 49 42 53 16,5 57 5,5	at div. 98 10 49 35,5 53 23,5 56 59	by div. 96 7 23,5 3 41,75	by div. 98 7 23,5 3 41,75	221,750
Continued.	413	Pos.	77·14 124·80 77·84 124·48	100·970 101·320 101·160	101·145 101·240	101·192	at div. 100 11 0 43,5 4 33 8 7,5	at div. 105 11 0 58,5 4 17,5 8 22,5	by div. 100 7 24,0 3 42,0	by div. 105 7 24,0 3 42,0	222,000

8th Series continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	414	Neg.	124·48 70·40 123·92 70·90	97·440 97·160 97·410	97·300 97·285	97·292	at div. 95 11 12 1 15 31,5 19 25,5	at div. 100 11 11 48 15 45 19 12,5	by div. 95 7 24,5 3 42,25	by div. 100 7 24,5 3 42,25	222,250
	415	Pos.	70·90 131·48 71·70 130·94	101·190 101·590 101·320	101·390 101·455	101·422	at div. 100 11 23 0,5 26 49 30 24	at div. 105 11 23 12 26 37 30 36	by div. 100 7 23,5 3 41,75	by div. 105 7 24,0 3 42,00	221,821
	416	Neg.	130·94 64·40 130·20 65·10	97·670 97·300 97·650	97·485 97·475	97·480	at div. 95 11 34 17 37 48,5 41 41,5	at div. 100 11 34 6 37 59,5 41 30,5	by div. 95 7 24,5 3 42,25	by div. 100 7 24,5 3 42,25	222,250
	417	Pos.	65·10 137·50 66·30 136·72	101·300 101·900 101·510	101·600 101·705	101·652	at div. 100 11 45 17,5 49 6 52 42	at div. 105 11 45 27 48 56 52 52	by div. 100 7 24,5 3 42,25	by div. 105 7 25,0 3 42,50	222,333
T = 50·31 B = 29·440	418	Neg.	136·72 59·20 135·70 60·28	97·960 97·450 97·990	97·705 97·720	97·712	at div. 95 11 56 34 0 0 7 3 58	at div. 100 11 56 25 0 0 16 3 49	by div. 95 7 24,0 3 42,0	by div. 100 7 24,0 3 42,0	222,000
April 6 T = B =	419	Pos.	98·90 104·40 99·00 104·30	101·650 101·700 101·650	101·675 101·675	101·675	at div. 101 7 14 47 19 8 22 10	at div. 102 7 15 14 18 40 22 38	by div. 101 7 23,0 3 41,5	by div. 102 7 24,0 3 42,0	221,837
	420	Neg.	104·30 91·00 104·10 91·24	97·650 97·550 97·670	97·600 97·610	97·605	at div. 97 7 26 16 29 44 33 39	at div. 98 7 26 5 29 55 33 28	by div. 97 7 23,0 3 41,5	by div. 98 7 23,0 3 41,5	221,500
	421	Pos.	91·24 111·90 91·70 111·60	101·570 101·800 101·650	101·685 101·725	101·705	at div. 101 7 37 18 41 9,5 44 41	at div. 102 7 37 25 41 2,5 44 48	by div. 101 7 23,0 3 41,5	by div. 102 7 23,0 3 41,5	221,500
	422	Neg.	111·60 83·90 111·12 84·20	97·750 97·510 97·660	97·630 97·585	97·607	at div. 97 7 48 35,5 52 11 55 59,5	at div. 98 7 48 30 52 16 55 54	by div. 97 7 24,0 3 42,0	by div. 98 7 24,0 3 42,0	222,000
	423	Pos.	84·20 118·80 84·78 118·40	101·500 101·790 101·590	101·645 101·690	101·667	at div. 100 7 59 35 8 3 30,5 6 58,5	at div. 102 7 59 43 8 3 22,5 7 7	by div. 100 7 23,5 3 41,75	by div. 102 7 24,0 3 42,00	221,958
	424	Neg.	118·40 77·20 117·80 77·60	97·800 97·500 97·700	97·650 97·600	97·625	at div. 96 8 10 55 14 26 18 18,5	at div. 98 8 10 48,5 14 33 18 12	by div. 96 7 23,5 3 41,75	by div. 98 7 23,5 3 41,75	221,750
			After an	interval masses	of about having	an hour remained	and a half, I re on the negative	sumed the ex side.	periments:	the	

8th SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	425	Neg.	112·20 83·00 111·86 83·40	97·600 97·430 97·630	97·515 97·530	97·522	at div. 96 9 54 34 58 2 10 2 0	at div. 98 9 54 24 58 12 10 1 50	by div. 96 7 26,0 3 43,0	by div. 98 7 26,0 3 43,0	• 223·000
	426	Pos.	83·40 119·68 84·00 119·32	101·540 101·840 101·660	101·690 101·750	101·720	at div. 100 10 5 32 9 28,5 12 57	at div. 102 10 5 40 9 20,5 13 5	by div. 100 7 25,0 3 42,5	by div. 102 7 25,0 3 42,5	222·500
	427	Neg.	119·32 76·60 118·70 77·18	97·960 97·650 97·940	97·805 97·795	97·800	at div. 95 10 17 0 20 25 24 26	at div. 100 10 16 43,5 20 41,5 24 9	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	222·860
	428	Pos.	77·18 126·26 78·08 125·70	101·720 102·170 101·890	101·945 102·030	101·987	at div. 100 10 27 58 31 52 35 23	at div. 105 10 28 12,5 31 37 35 38	by div. 100 7 25,0 3 42,50	by div. 105 7 25,5 3 42,75	222·599
	429	Neg.	125·70 70·60 125·00 71·40	98·150 97·800 98·200	97·975 98·000	97·987	at div. 95 10 39 22 42 49 46 48	at div. 100 10 39 9 43 2 46 34,5	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	222·851
	430	Pos.	71·40 132·42 72·26 131·80	101·910 102·340 102·030	102·125 102·185	102·155	at div. 100 10 50 20,5 54 13 57 45,5	at div. 105 10 50 32 54 1,5 57 57,5	by div. 100 7 25,0 3 42,50	by div. 105 7 25.5 3 42,75	222·608
	431	Neg.	131·80 64·90 130·90 65·80	98·350 97·900 98·350	98·125 98·125	98·125	at div. 95 11 1 41,5 5 11,5 9 7	at div. 100 11 1 31 5 22 8 56,5	by div. 95 7 25,5 3 42,75	by div. 100 7 25,5 3 42,75	222·750
	432	Pos.	65·80 138·20 66·80 137·32	102·000 102·500 102·060	102·250 102·280	102·265	at div. 100 11 12 40 16 31,5 20 5	at div. 105 11 12 50 16 21,5 20 15	by div. 100 7 25,0 3 42,5	by div. 105 7 25,0 3 42,5	222·500
	433	Neg.	137·32 59·72 136·30 60·70	98·520 98·010 98·500	98·265 98·255	98·260	at div. 95 11 24 0 27 31 31 26	at div. 100 11 23 51 27 40 31 16,5	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	222·837
	434	Pos.	60·70 143·34 62·00 142·20	102·020 102·670 102·100	102·345 102·385	102·365	at div. 100 11 35 0,5 38 52 42 26	at div. 105 11 35 9 38 43 42 35	by div. 100 7 25,5 3 42,75	by div. 105 7 26,0 3 43,00	222·868
	435	Neg.	142·20 55·00 140·94 56·12	98·600 97·970 98·530	98·285 98·250	98·267	at div. 95 11 46 20 49 53 53 46	at div. 100 11 46 12,5 50 1 53 38	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	222,837
Continued.	436	Pos.	56·12 147·92 57·60 146·74	102·020 102·760 102·170	102·390 102·465	102·427	at div. 100 11 57 22 0 1 12,5 4 47,5	at div. 105 11 57 29,5 0 1 4,5 4 55,5	by div. 100 7 25,5 3 42,75	by div. 105 7 26,0 3 43,00	222·871

8th Series continued.—2¼-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	437	Neg.	146·74 50·70 145·40 51·90	98·720 98·050 98·650	98·385 98·350	98·367	at div. 95 0 8 40 12 13 16 6	at div. 100 0 8 32,5 12 20,5 15 58	by div. 95 7 26,0 3 43,00	by div. 100 7 25,5 3 42,75	• 222,831
	438	Pos.	51·90 152·14 53·20 150·80	102·020 102·670 102·000	102·345 102·335	102·340	at div. 100 0 19 41,5 23 31 27 7	at div. 105 0 19 48,5 23 24 27 14	by div. 100 7 25,5 3 42,75	by div. 105 7 25,5 3 42,75	222,750
	439	Neg.	150·80 46·70 149·30 48·00	98·750 98·000 98·650	98·375 98·325	98·350	at div. 95 0 30 59 34 33 38 24,5	at div. 100 0 30 52 34 39,5 38 17,5	by div. 95 7 25,5 3 42,75	by div. 100 7 25,5 3 42,75	222,750
T = 50·58 B = 29·722	440	Pos.	48·00 156·00 49·70 154·52	102·000 102·850 102·110	102·425 102·480	102·452	at div. 100 0 42 0,5 45 50 49 26	at div. 105 0 42 7 45 43,5 49 32,5	by div. 100 7 25,5 3 42,75	by div. 105 7 25,5 3 42,75	222,750
April 7 T = 50·27 B = 29·820	441	Pos.	99·10 103·90 99·20 103·80	101·500 101·550 101·500	101·525 101·525	101·525	at div. 101 11 29 29 33 42 36 51	at div. 102 11 30 0 33 11 37 22	by div. 101 7 22,0 3 41,0	by div. 102 7 22,0 3 41,0	221,000
	442	Neg.	103·80 91·20 103·62 91·30	97·500 97·410 97·460	97·455 97·435	97·445	at div. 97 11 41 6,5 44 39 48 30,5	at div. 98 11 40 55 44 50 48 19	by div. 97 7 24,0 3 42,0	by div. 98 7 24,0 3 42,0	222,000
	443	Pos.	91·30 111·30 92·00 111·00	101·300 101·650 101·500	101·475 101·575	101·525	at div. 101 11 52 17 56 7,5 59 41,5	at div. 102 11 52 24,5 56 0 59 49	by div. 101 7 24,5 3 42,25	by div. 102 7 24,5 3 42,25	222,250
	444	Neg.	111·00 84·30 110·74 85·20	97·650 97·520 97·970	97·585 97·745	97·665	at div. 97 0 3 36 7 13 11 4	at div. 98 0 3 31 7 18 10 58	by div. 97 7 28,0 3 44,0	by div. 98 7 27,0 3 43,5	223,668
	445	Pos.	85·20 117·90 86·00 117·60	101·550 101·950 101·800	101·750 101·875	101·812	at div. 100 0 14 38 18 36,5 22 2	at div. 102 0 14 47 18 27,5 22 11	by div. 100 7 24,0 3 42,0	by div. 102 7 24,0 3 42,0	222,000
	446	Neg.	117·60 78·40 117·22 78·90	98·000 97·810 98·060	97·905 97·935	97·920	at div. 96 0 26 0 29 29 33 25,5	at div. 98 0 25 52,5 29 36 33 18	by div. 96 7 25,5 3 42,75	by div. 98 7 25,5 3 42,75	222,750
	447	Pos.	78·90 124·82 79·78 124·30	101·860 102·300 102·040	102·080 102·170	102·125	at div. 100 0 36 58,5 40 54,5 44 23,5	at div. 105 0 37 14 40 38,5 44 39,5	by div. 100 7 25,0 3 42,50	by div. 105 7 25,5 3 42,75	222,606
T = 50·30 B = 29·812	448	Neg.	124·30 72·30 123·70 73·00	98·300 98·000 98·350	98·150 98·175	98·162	at div. 95 0 48 23,5 51 49,5 55 50	at div. 100 0 48 10 52 3 55 36	by div. 95 7 26,5 3 43,25	by div. 100 7 26,0 3 43,00	223,092

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9th SERIES.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
April 10 T = 49·35 B = 30·076	449	Pos.	94·50 106·46 95·22 106·40	100·480 100·840 100·810	100·660 100·825	100·742	at div. 100 11 37 56 44 56 50 51	at div. 101 11 38 17 44 34 51 14	by div. 100 12 55,0 6 27,50	by div. 101 12 57,0 6 28,50	388,242
	450	Neg.	106·40 71·08 105·10 73·00	88·740 88·090 89·050	88·415 88·570	88·492	at div. 88 11 58 10 missed. 0 11 25	at div. 89 11 58 2,5 missed. 0 11 17	by div. 88 13 15,0 6 37,50	by div. 89 13 14,5 6 37,25	397,377
	451	Pos.	73·00 130·14 76·30 128·90	101·570 103·220 102·600	102·395 102·910	102·652	at div. 100 0 17 57,5 25 1 31 15	at div. 105 0 18 20 24 37,5 31 40	by div. 100 13 17,5 6 38,75	by div. 105 13 20,0 6 40,00	399,414
	452	Neg.	128·90 53·12 126·10 56·30	91·010 89·610 91·200	90·310 90·405	90·357	at div. 90 0 38 21 45 2 51 50,5	at div. 95 0 38 4 45 20 51 32	by div. 90 13 29,5 6 44,75	by div. 95 13 28,0 6 44,00	404,696
	453	Pos.	56·30 149·44 60·70 146·12	102·870 105·070 103·410	103·970 104·240	104·105	at div. 100 0 58 29 1 5 37,5 11 59	at div. 105 0 58 42,5 1 5 23 12 14	by div. 100 13 30,0 6 45,00	by div. 105 13 31,5 6 45,75	405,616
T = 49·60 B = 30·068	454	Neg.	146·12 38·50 141·48 42·80	92·310 89·990 92·140	91·150 91·065	91·107	at div. 90 1 19 6,5 25 47 32 41	at div. 95 1 18 54,5 26 0 32 28	by div. 90 13 34,5 6 47,25	by div. 95 13 33,5 6 46,75	407,139
April 11 T = 48·00 B = 29·960	455	Pos.	101·80 113·64 102·20 113·14	107·720 107·920 107·670	107·820 107·795	107·807	at div. 107 9 58 14 10 5 9 10 58	at div. 108 9 58 34 10 4 48 11 20	by div. 107 12 44,0 6 22,0	by div. 108 12 46,0 6 23,0	382,807
	456	Neg.	113·14 79·54 111·28 81·24	96·340 95·410 96·260	95·875 95·835	95·855	at div. 95 10 18 6,5 24 18 30 55,5	at div. 96 10 17 59 24 26 30 47	by div. 95 12 49,0 6 24,5	by div. 96 12 48,0 6 24,0	384,073
	457	Pos.	81·24 132·84 83·90 130·40	107·040 108·370 107·150	107·705 107·760	107·732	at div. 105 10 37 12 44 2 49 56,5	at div. 110 10 37 36 43 37 50 23	by div. 105 12 44,5 6 22,25	by div. 110 12 47,0 6 23,50	382,933
	458	Neg.	130·40 62·20 126·90 64·70	96·300 94·550 95·800	95·425 95·175	95·300	at div. 95 10 56 40 11 3 1 9 25,5	at div. 100 10 56 22,5 11 3 19,5 9 6	by div. 95 12 45,5 6 22,75	by div. 100 12 43,5 6 21,75	382,690
	459	Pos.	64·70 147·12 67·80 143·70	105·910 107·460 105·750	106·685 106·605	106·645	at div. 105 11 15 48 22 21 28 34,5	at div. 110 11 16 3 22 6 28 50,5	by div. 105 12 46,5 6 23,25	by div. 110 12 47,5 6 23,75	383,414
Continued.	460	Neg.	143·70 46·50 139·28 49·40	95·100 92·890 94·340	93·995 93·615	93·805	at div. 90 11 35 18 41 21 48 5	at div. 95 11 35 5,5 41 34,5 47 51	by div. 90 12 47,0 6 23,50	by div. 95 12 45,5 6 22,75	382,929

9th SERIES continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	461	Pos.	49·40 159·48 53·70 156·38	104·440 106·590 105·040	105·515 105·815	105·665	at div. 105 11 54 23 0 0 53 7 16,5	at div. 110 11 54 34 0 0 41 7 28,5	by div. 105 12 53,5 6 26,75	by div. 110 12 54,5 6 27,25	386,816
	462	Neg.	156·38 34·20 153·00 39·90	95·290 93·600 96·450	94·445 95·025	94·735	at div. 90 0 14 0,5 20 10 27 6	at div. 95 0 13 50,5 20 21 26 55	by div. 90 13 5,5 6 32,75	by div. 95 13 4,5 6 32,25	392,277
	463	Pos.	39·90 175·16 46·28 170·80	107·530 110·720 108·540	109·125 109·630	109·377	at div. 105 0 33 25 40 17 46 37	at div. 110 0 33 34,5 40 7 46 47,5	by div. 105 13 12,0 6 36,0	by div. 110 13 13,0 6 36,5	396,438
T = 48·38 B = 29·958	464	Neg.	170·80 26·60 164·60 32·40	98·700 95·600 98·500	97·150 97·050	97·100	at div. 95 0 53 34 1 0 7,5 6 58	at div. 100 0 53 25 1 0 17 6 48,5	by div. 95 13 24,0 6 42,00	by div. 100 13 23,5 6 41,75	401,895
April 12 T = 46·37 B = 29·926	465	Pos.	97·90 109·46 98·40 109·10	103·680 103·930 103·750	103·805 103·840	103·822	at div. 103 9 46 36 53 30 59 14	at div. 104 9 46 57 53 8 59 36,5	by div. 103 12 38,0 6 19,00	by div. 104 12 39,5 6 19,75	379,616
	466	Neg.	109·10 76·00 107·34 77·16	92·550 91·670 92·250	92·110 91·960	92·035	at div. 92 10 6 10,5 12 31 18 52,5	at div. 93 10 6 3 12 39 18 44	by div. 92 12 42,0 6 21,0	by div. 93 12 41,0 6 20,5	380,983
	467	Pos.	77·16 129·00 79·42 126·90	103·080 104·210 103·160	103·645 103·685	103·665	at div. 102 10 25 15 31 53 37 58	at div. 104 10 25 24,5 31 43,5 38 8	by div. 102 12 43,0 6 21,50	by div. 104 12 43,5 6 21,75	381,708
	468	Neg.	126·90 57·90 123·40 59·88	92·400 90·650 91·640	91·525 91·145	91·335	at div. 90 10 44 41 50 52,5 57 24	at div. 92 10 44 34 51 0 57 16,5	by div. 90 12 43,0 6 21,50	by div. 92 12 42,5 6 21,25	381,333
	469	Pos.	59·88 143·78 63·12 140·48	101·830 103·450 101·800	102·640 102·625	102·632	at div. 100 11 3 40,5 10 20 16 28	at div. 105 11 3 55 10 5 16 43,5	by div. 100 12 47,5 6 23,75	by div. 105 12 48,5 6 24,25	384,013
T = 46·55 B = 29·920	470	Neg.	140·48 42·20 137·40 46·20	91·340 89·800 91·800	90·570 90·800	90·685	at div. 90 11 23 6 29 30 36 7	at div. 95 11 22 54 29 43 35 53,5	by div. 90 13 1,0 6 30,50	by div. 95 12 59,5 6 29,75	389,397
April 13 T = 45·65 B = 30·100	471	Pos.	95·80 107·60 96·44 106·90	101·700 102·020 101·670	101·860 101·845	101·855	at div. 101 11 28 58 35 58 41 42	at div. 102 11 29 18 35 35 42 5,5	by div. 101 12 44,0 6 22,00	by div. 102 12 47,5 6 23,75	383,496
Continued.	472	Neg.	106·90 72·98 105·12 74·32	89·940 89·050 89·720	89·495 89·385	89·440	at div. 89 11 48 45,5 55 4 0 1 38	at div. 90 11 48 38 55 12 0 1 30	by div. 89 12 52,5 6 26,25	by div. 90 12 52,0 6 26,0	386,140

9th Series continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
						h m s	h m s	m s	m s	s
Continued.	473	Pos.	74·32 127·70 76·90 127·42	101·010 102·300 102·160	101·655 102·230	101·942	at div. 100 0 8 7 14 54 21 5,5	at div. 102 0 8 16 14 44 21 15	by div. 100 12 58,5 6 29,25	by div. 102 12 59,0 6 29,50	389,493
	474	Neg.	127·42 54·78 125·48 57·96	91·100 90·130 91·720	90·615 90·925	90·770	at div. 90 0 28 7 34 42 41 32,5	at div. 92 0 28 0 34 49,5 41 25	by div. 90 13 25,5 6 42,75	by div. 92 13 25,0 6 42,50	402,654
	475	Pos.	57·96 149·18 62·14 146·00	103·570 105·660 104·070	104·615 104·865	104·740	at div. 100 0 48 4 55 17 1 1 33	at div. 105 0 48 18,5 55 2 1 1 49	by div. 100 13 29,0 6 44,50	by div. 105 13 30,5 6 45,25	405,211
T = 46·18 B = 30·096	476	Neg.	146·00 40·00 141·00 44·30	93·000 90·500 92·650	91·750 91·575	91·662	at div. 90 1 8 45,5 15 22,5 22 20,5	at div. 95 1 8 33 15 35 22 7	by div. 90 13 35,0 6 47,5	by div. 95 13 34,0 6 47,0	407,334
April 14 T = 48·37 B = 30·092	477	Pos.	94·40 107·94 95·40 107·92	101·170 101·670 101·660	101·420 101·665	101·542	at div. 101 10 14 29,5 21 38,5 28 2,5	at div. 102 10 14 50 21 17 28 25	by div. 101 13 33,0 6 46,5	by div. 102 13 35,0 6 47,5	407,042
	478	Neg.	107·92 70·30 106·60 72·60	89·110 88·450 89·600	88·780 89·025	88·902	at div. 88 10 35 28 42 7 49 13,5	at div. 89 10 35 21 42 14 49 5,5	by div. 88 13 45,5 6 52,75	by div. 89 13 44,5 6 52,25	412,299
	479	Pos.	72·60 131·50 76·00 129·20	102·050 103·750 102·600	102·900 103·175	103·037	at div. 102 10 55 57,5 11 2 56 9 33,5	at div. 104 10 56 6,5 11 2 46,5 9 43,5	by div. 102 13 36,0 6 48,0	by div. 104 13 37,0 6 48,5	408,259
	480	Neg.	129·20 53·10 125·80 56·90	91·150 89·450 91·350	90·300 90·400	90·350	at div. 90 11 16 35 23 21 30 12	at div. 92 11 16 28,5 23 28 29 4,5	by div. 90 13 37,0 6 48,5	by div. 92 13 36,0 6 48,0	408,413
	481	Pos.	56·90 148·50 61·80 144·14	102·700 105·150 102·970	103·925 104·060	103·992	at div. 100 11 36 52 44 3 50 27	at div. 105 11 37 7 43 48 50 43	by div. 100 13 35,0 6 47,5	by div. 105 13 36,0 6 48,0	407,899
	482	Neg.	144·14 40·28 138·80 45·60	92·210 89·540 92·200	90·875 90·870	90·872	at div. 90 11 57 33,5 0 4 17 11 11	at div. 95 11 57 21 0 4 30,5 10 57	by div. 90 13 37,5 6 48,75	by div. 95 13 36,0 6 48,0	408,619
	483	Pos.	45·60 159·70 52·20 154·00	102·650 105·950 103·100	104·300 104·525	104·412	at div. 100 0 17 51,5 25 0 31 26	at div. 105 0 18 3 24 48 31 38,5	by div. 100 13 34,5 6 47,25	by div. 105 13 35,5 6 47,75	407,691
Continued.	484	Neg.	154·00 32·00 147·00 38·50	93·000 89·500 92·750	91·250 91·125	91·187	at div. 90 0 38 32 45 13 52 6	at div. 95 0 38 21 45 24,5 51 54	by div. 90 13 34,0 6 47,0	by div. 95 13 33,0 6 46,5	406,881

9th Series continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	485	Pos.	58·50 166·80 45·80 160·10	102·650 106·500 102·950	104·475 104·625	104·550	at div. 100 0 58 45 1 5 51 12 18	at div. 105 0 58 55 1 5 40 12 29	by div. 100 13 33,0 6 46,5	by div. 105 15 34,0 6 47,0	406,955
	486	Neg.	160·10 26·40 152·50 33·50	93·250 89·450 93·000	91·350 91·225	91·287	at div. 90 1 19 20,5 26 2 32 54,5	at div. 95 1 19 11 26 12 32 44	by div. 90 13 34,0 6 47,0	by div. 95 15 33,0 6 46,5	406,871
	487	Pos.	33·50 171·60 41·60 164·50	102·550 106·600 102·950	104·575 104·775	104·675	at div. 100 1 59 52,5 46 37 53 4,5	at div. 105 1 59 42 46 26,5 55 15	by div. 100 15 52,0 6 46,0	by div. 105 15 33,0 6 46,5	406,467
T=48·58 B=30·060	488	Neg.	164·30 22·90 156·10 30·48	93·600 89·500 93·290	91·550 91·595	91·472	at div. 90 2 0 6,5 missed 15 59	at div. 95 1 59 57 missed. 2 15 28,5	by div. 90 13 32,5 6 46,25	by div. 95 15 31,5 6 45,75	406,103
April 18 T=48·83 B=29·920	489	Pos.	90·90 102·70 91·34 102·40	96·800 97·020 96·870	96·910 96·945	96·927	at div. 96 10 11 0 18 5 25 52	at div. 97 10 11 20 17 43 24 14	by div. 96 12 52,0 6 26,0	by div. 97 12 54,0 6 27,0	586,927
	490	Neg.	102·40 67·40 101·00 67·90	84·900 84·200 84·450	84·550 84·325	84·437	at div. 84 10 30 58 37 20,5 45 58	at div. 85 10 50 51 37 28 43 50,5	by div. 84 13 0,0 6 50,00	by div. 85 12 59,5 6 29,75	389,891
	491	Pos.	67·90 126·20 70·60 124·80	97·050 98·400 97·700	97·725 98·050	97·887	at div. 96 10 50 39 57 37,5 11 4 0,5	at div. 98 10 50 48 57 28 11 4 10	by div. 96 15 21,5 6 40,75	by div. 98 13 22,0 6 41,00	400,986
	492	Neg.	124·80 47·46 122·00 50·20	86·130 84·730 86·100	85·430 85·415	85·422	at div. 84 11 11 8,5 17 41 24 37	at div. 86 11 11 2 17 48 24 30	by div. 84 13 28,5 6 44,25	by div. 86 13 28,0 6 44,00	404,073
	493	Pos.	50·20 145·10 54·20 141·00	97·650 99·650 97·600	98·650 98·625	98·637	at div. 95 11 51 12 58 20 44 45	at div. 100 11 51 26 38 5,5 45 0	by div. 95 13 33,0 6 46,5	by div. 100 13 34,0 6 47,0	406,864
	494	Neg.	141·00 32·50 135·50 37·08	86·650 83·800 86·190	85·225 84·995	85·110	at div. 85 11 51 49 58 53,5 0 5 23	at div. 90 11 51 37,5 58 46 0 5 9,5	by div. 85 13 34,0 6 47,0	by div. 90 15 32,0 6 46,0	406,978
	495	Pos.	37·08 156·50 45·28 151·00	96·790 99·890 97·140	98·340 98·515	98·427	at div. 95 0 12 7 19 11,5 25 42,5	at div. 100 0 12 18 19 0 25 54,5	by div. 95 13 35,5 6 47,75	by div. 100 13 36,5 6 48,25	408,095
T=49·41 B=29·960	496	Neg.	151·00 23·10 144·40 29·12	87·050 83·750 86·760	85·400 85·255	85·527	at div. 85 0 32 45 39 27 46 17,5	at div. 90 0 32 32,5 59 58 46 6	by div. 85 13 34,5 6 47,25	by div. 90 13 55,5 6 46,75	407,217

9th SERIES continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
April 19 T=51·83 B=29·922	497	Neg.	92·50 78·62 91·50 78·92	85·650 85·060 85·210	85·310 85·135	85·222	at div. 85 2 38 44 45 18 52 8	at div. 86 2 38 26 45 38 51 48	by div. 85 13 24,0 6 42,0	by div. 86 13 22,0 6 41,0	401,778
	498	Pos.	78·92 116·66 80·80 114·76	97·790 98·730 97·780	98·260 98·255	98·257	at div. 98 2 59 0 3 5 50,5 12 33,5	at div. 99 2 59 7 3 5 43 12 41	by div. 98 13 33,5 6 46,75	by div. 99 13 34,0 6 47,00	406,814
	499	Neg.	114·76 56·80 111·68 59·80	85·780 84·240 85·740	85·010 84·990	85·000	at div. 84 3 19 32 26 9 33 6	at div. 86 3 19 23 26 18,5 32 56	by div. 84 13 34,0 6 47,0	by div. 86 13 33,0 6 46,5	406,750
	500	Pos.	59·80 134·86 64·00 131·00	97·330 99·430 97·500	98·380 98·465	98·422	at div. 98 3 39 52 46 42,5 53 25	at div. 100 3 39 59 46 35 53 33	by div. 98 13 33,0 6 46,5	by div. 100 13 34,0 6 47,0	406,605
	501	Neg.	131·00 41·90 126·10 46·60	86·450 84·000 86·350	85·225 85·175	85·200	at div. 85 4 0 19 7 24 13 52	at div. 90 4 0 4,5 7 19 13 36	by div. 85 13 33,0 6 46,50	by div. 90 13 31,5 6 45,75	406,470
T=52·50 B=29·910	502	Pos.	46·60 147·64 52·56 142·30	97·120 100·100 97·430	98·610 98·765	98·687	at div. 95 4 20 33,5 27 40 34 5	at div. 100 4 20 46,5 27 26 34 19,5	by div. 95 13 31,5 6 45,75	by div. 100 13 33,0 6 46,50	406,303

10th SERIES.—2-inch *Lead* balls, with bifilar *brass* wire; distance = ·415 inch.

April 23 T=50·57 B=29·530	503	Pos.	102·50 105·34 102·58 105·32	103·920 103·960 103·950	103·940 103·955	103·947	at div. 104 2 26 34 29 5 32 26	at div. 105 2 27 19 28 39 33 12	by div. 104 5 52,0 2 56,0	by div. 105 5 53,0 2 56,5	175,974
	504	Neg.	105·32 97·70 105·20 97·90	101·510 101·450 101·550	101·480 101·500	101·490	at div. 100 2 35 51 38 2 41 46	at div. 101 2 35 36 38 18 41 30	by div. 100 5 55,0 2 57,5	by div. 101 5 54,0 2 57,0	176,755
	505	Pos.	97·90 110·10 98·22 109·98	104·000 104·160 104·100	104·080 104·050	104·065	at div. 104 2 44 25 47 24 50 17	at div. 105 2 44 35 missed. 50 27,5	by div. 104 5 52,0 2 56,00	by div. 105 5 52,5 2 56,25	176,016
T=50·57 B=29·530	506	Neg.	109·98 93·60 109·60 93·90	101·790 101·600 101·750	101·695 101·675	101·685	at div. 101 2 53 26 56 13 59 19,5	at div. 102 2 53 19 56 20 59 12	by div. 101 5 53,5 2 56,75	by div. 102 5 53,0 2 56,50	176,579
April 27 T=59·85 B=30·140	507	Neg.	102·30 97·18 102·20 97·28	99·740 99·690 99·740	99·715 99·715	99·715	at div. 99 1 44 52 47 17 50 47	at div. 100 1 44 30 47 40 50 24	by div. 99 5 55,0 2 57,5	by div. 100 5 54,0 2 57,0	177,143

10th SERIES continued.—2-inch *Lead* balls, with bifilar *brass* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	508	Pos.	97·28 106·92 97·70 106·70	102·100 102·310 102·200	102·205 102·255	102·230	at div. 102 1 53 35 56 38 59 28,5	at div. 103 1 53 47 56 26 59 41	by div. 102 5 53,5 2 56,75	by div. 103 5 54,0 2 57,00	176·807
	509	Neg.	106·70 92·92 106·30 93·30	99·810 99·610 99·800	99·710 99·705	99·707	at div. 98 2 2 48,5 5 16 8 43	at div. 100 2 2 32 5 33 8 25	by div. 98 5 54,5 2 57,25	by div. 100 5 53,0 2 56,50	176,610
	510	Pos.	93·30 110·80 93·90 110·32	102·050 102·350 102·110	102·200 102·230	102·215	at div. 102 2 11 29 14 29 17 22,5	at div. 104 2 11 42 14 16 17 36	by div. 102 5 53,5 2 56,75	by div. 104 5 54,0 2 57,00	176,777
	511	Neg.	110·32 89·50 109·64 90·08	99·910 99·570 99·860	99·740 99·715	99·727	at div. 98 2 20 37 23 15 26 31	at div. 100 2 20 26 23 26 26 19,5	by div. 98 5 54,0 2 57,00	by div. 100 5 53,5 2 56,75	176,784
	512	Pos.	90·08 114·00 90·86 113·40	102·040 102·430 102·130	102·235 102·280	102·257	at div. 102 2 29 20,5 32 20 35 14	at div. 104 2 29 30 32 10,5 35 24	by div. 102 5 53,5 2 56,75	by div. 104 5 54,0 2 57,00	176,782
	513	Neg.	113·40 86·48 112·62 87·20	99·940 99·550 99·910	99·745 99·730	99·737	at div. 95 2 38 36 40 51,5 44 31	at div. 100 2 38 15 41 13 44 8	by div. 95 5 55,0 2 57,5	by div. 100 5 53,0 2 56,5	176,553
	514	Pos.	87·20 116·82 88·18 116·00	102·010 102·500 102·090	102·255 102·295	102·275	at div. 100 2 47 1 50 16 52 54	at div. 105 2 47 20 49 56 53 55	by div. 100 5 53,0 2 56,5	by div. 105 5 55,0 2 57,5	176,955
	515	Neg.	116·00 84·08 115·00 85·00	100·040 99·540 100·000	99·790 99·770	99·780	at div. 95 2 56 21 58 43 3 2 15,5	at div. 100 2 56 3 59 1 3 1 56	by div. 95 5 54,5 2 57,25	by div. 100 5 53,0 2 56,50	176,533
	516	Pos.	85·00 118·80 86·28 117·92	101·900 102·540 102·100	102·220 102·320	102·270	at div. 100 3 4 51,5 8 4 10 44,5	at div. 105 3 5 8,5 7 46,5 11 2,5	by div. 100 5 53,0 2 56,5	by div. 105 5 54,0 2 57,0	176,727
	517	Neg.	117·92 82·20 116·84 83·10	100·060 99·520 99·970	99·790 99·745	99·767	at div. 95 3 14 8 16 33 20 2	at div. 100 3 13 51,5 16 50 19 45	by div. 95 5 54,0 2 57,00	by div. 100 5 53,5 2 56,75	176,762
	518	Pos.	83·10 121·10 84·30 120·00	102·100 102·700 102·150	102·400 102·425	102·412	at div. 100 3 22 38 25 49 28 31,5	at div. 105 3 22 53 25 34 28 47	by div. 100 5 53,5 2 56,75	by div. 105 5 54,0 2 57,00	176,871
Continued.	519	Neg.	120·00 80·32 118·70 81·40	100·160 99·510 100·050	99·835 99·780	99·807	at div. 95 3 31 51,5 34 20 37 46	at div. 100 3 31 37 34 35 37 31	by div. 95 5 54,5 2 57,25	by div. 100 5 54,0 2 57,00	177,010

10th SERIES continued.— 2-inch *Lead* balls, with bifilar *brass* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T = 61·05 B = 30·150	520	Pos.	81·40 122·60 82·60 121·50	102·000 102·600 102·050	102·300 102·525	102·312	at div. 100 3 40 24 43 34 46 17	at div. 105 3 40 57,5 43 19,5 46 31,5	by div. 100 5 55,0 2 56,5	by div. 105 5 54,0 2 57,0	176,751
April 28 T = 63·10 B = 30·204	521	Pos.	99·18 105·14 99·28 105·10	102·160 102·210 109·190	102·185 102·200	102·192	at div. 102 10 8 11 11 14 14 4	at div. 103 10 8 50 10 54 14 24	by div. 102 5 53,0 2 56,5	by div. 105 5 54,0 2 57,0	176,596
	522	Neg.	105·10 94·46 104·90 94·66	99·780 99·680 99·780	99·750 99·750	99·730	at div. 99 10 17 21 20 2 23 15	at div. 100 10 17 10 20 13 25 3,5	by div. 99 5 54,0 2 57,00	by div. 100 5 53,5 2 56,75	176,818
	523	Pos.	94·66 109·60 95·10 109·48	102·150 102·350 102·290	102·240 102·520	102·280	at div. 102 10 26 8 29 10 32 1,5	at div. 103 10 26 16 29 2 52 9,5	by div. 102 5 53,5 2 56,75	by div. 103 5 53,5 2 56,75	176,750
	524	Neg.	109·48 90·40 109·10 90·78	99·940 99·750 99·940	99·845 99·845	99·845	at div. 99 10 35 10,5 57 57 41 4,5	at div. 100 10 35 4 38 3 40 58	by div. 99 5 54,0 2 57,0	by div. 100 5 54,0 2 57,0	177,000
	525	Pos.	90·78 115·70 91·52 113·40	102·240 102·510 102·360	102·575 102·435	102·405	at div. 102 10 43 58 46 59,5 49 51,5	at div. 104 10 44 8 46 49,5 50 2	by div. 102 5 53,5 2 56,75	by div. 104 5 54,0 2 57,0	176,801
	526	Neg.	113·40 86·70 112·92 87·20	100·050 99·810 100·060	99·930 99·935	99·932	at div. 98 10 55 1,5 missed. 58 56	at div. 100 10 52 53 missed. 58 47	by div. 98 5 54,5 2 57,25	by div. 100 5 54,0 2 57,00	177,009
	527	Pos.	87·20 117·40 87·94 116·94	102·500 102·670 102·440	102·485 102·555	102·520	at div. 102 11 1 45,5 4 46,5 7 59	at div. 104 11 1 55 4 59 7 46,5	by div. 102 5 53,5 2 56,75	by div. 104 5 55,5 2 56,75	176,750
	528	Neg.	116·94 83·52 116·30 84·12	100·230 99·910 100·210	100·070 100·060	100·065	at div. 100 11 10 41 15 57 16 54,5	at div. 102 11 10 34 13 43,5 16 27	by div. 100 5 53,5 2 56,75	by div. 102 5 53,0 2 56,50	176,742
	529	Pos.	84·12 120·70 84·90 120·18	102·410 102·800 102·540	102·605 102·670	102·637	at div. 102 11 19 31 22 32 25 24,5	at div. 104 11 19 57 22 26 25 31	by div. 102 5 53,5 2 56,75	by div. 104 5 54,0 2 57,00	176,850
	530	Neg.	120·18 80·60 119·40 81·50	100·590 100·000 100·350	100·195 100·175	100·185	at div. 100 11 28 25,5 31 21 34 19	at div. 102 11 28 19,5 51 27 34 13	by div. 100 5 53,5 2 56,75	by div. 102 5 53,5 2 56,75	176,750
Continued.	531	Pos.	81·30 123·70 82·20 123·00	102·500 102·950 102·600	102·725 102·775	102·750	at div. 102 11 57 15 40 16 45 8	at div. 104 11 57 20 40 11 45 15,5	by div. 102 5 53,0 2 56,50	by div. 104 5 53,5 2 56,75	176,594

10th SERIES continued.—2-inch *Lead* balls, with bifilar *brass* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	532	Pos.	123·00 78·00 122·10 78·90	100·500 100·050 100·500	100·275 100·275	100·275	at div. 100 11 46 9,5 missed. 52 3,5	at div. 102 11 46 5 missed. 51 58	by div. 100 5 54,0 2 57,0	by div. 102 5 53,0 2 56,5	176,931
	533	Neg.	78·90 126·18 80·00 125·30	102·540 103·090 102·650	102·815 102·870	102·842	at div. 100 11 54 54 57 55 0 0 46,5	at div. 105 11 55 6 57 42,5 0 0 59	by div. 100 5 52,5 2 56,25	by div. 105 5 53,0 2 56,50	176,392
T = 63·60 B = 30·200	534	Neg.	125·30 75·92 124·20 76·90	100·610 100·060 100·550	100·335 100·305	100·320	at div. 100 0 3 53 6 48 9 46,5	at div. 105 0 3 41 6 59,5 9 34	by div. 100 5 53,5 2 56,75	by div. 105 5 53,0 2 56,50	176,734

11th SERIES.—2-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

April 29 T = 63·65 B = 30·160	535	Pos.	99·60 104·54 99·70 104·40	102·070 102·120 102·050	102·095 102·085	102·090	at div. 102 2 31 53 35 30 38 54,5	at div. 103 2 32 21 35 1 39 24	by div. 102 7 1,5 3 30,75	by div. 103 7 3,0 3 31,5	210,817
	536	Neg.	104·40 92·70 104·12 92·94	98·550 98·410 98·530	98·480 98·470	98·475	at div. 98 2 42 47 46 4,5 49 47	at div. 99 2 42 35 46 17 49 35	by div. 98 7 0,0 3 30,0	by div. 99 7 0,0 3 30,0	210,000
	537	Pos.	92·94 110·90 93·40 110·48	101·920 102·150 101·940	102·035 102·045	102·040	at div. 102 2 53 17,5 56 48 3 0 18	at div. 104 2 53 33 56 32 3 0 34	by div. 102 7 0,5 3 30,25	by div. 104 7 1,0 3 30,50	210,255
	538	Neg.	110·48 86·80 109·90 87·32	98·640 98·350 98·610	98·495 98·480	98·487	at div. 98 3 3 55 7 20 10 56	at div. 100 3 3 43,5 7 31 10 44	by div. 98 7 1,0 3 30,50	by div. 100 7 0,5 3 30,25	210,439
	539	Pos.	87·32 116·20 88·20 115·52	101·760 102·200 101·860	101·980 102·030	102·005	at div. 102 3 14 27,5 17 58 21 28	at div. 104 3 14 37 17 49 21 38	by div. 102 7 0,5 3 30,25	by div. 104 7 1,0 3 30,50	210,250
	540	Neg.	115·52 81·90 114·60 82·58	98·710 98·250 98·590	98·480 98·420	98,450	at div. 98 3 25 3,5 missed. 32 4	at div. 100 3 24 55,5 missed. 31 55,5	by div. 98 7 0,5 3 30,25	by div. 100 7 0,0 3 30,00	210,194
	541	Pos.	82·58 120·72 83·80 119·82	101·650 102·260 101·810	101·955 102·035	101·995	at div. 100 3 35 28,5 39 14 42 29	at div. 102 3 35 36 39 7 42 36,5	by div. 100 7 0,5 3 30,25	by div. 102 7 0,5 3 30,25	210,250
Continued.	542	Neg.	119·82 77·70 118·68 78·76	98·760 98·190 98·720	98·475 98·455	98·465	at div. 98 3 46 10,5 49 37,5 53 11	at div. 100 3 46 4,5 49 44 53 4,5	by div. 98 7 0,5 3 30,25	by div. 100 7 0,0 3 30,00	210,192

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	543	Pos.	78·76 124·60 80·10 123·40	101·680 102·350 101·750	102·015 102·050	102·032	at div. 100 3 56 36 4 0 19 3 36.5	at div. 105 3 56 51 4 0 4 3 52	by div. 100 7 0,5 3 30,25	by div. 105 7 1,0 3 30,50	* 210·352
	544	Neg.	123·40 74·28 122·02 75·60	98·840 98·150 98·810	98·495 98·480	98·487	at div. 95 4 7 25 10 36 14 26,5	at div. 100 4 7 11,5 10 50 14 12	by div. 95 7 1,5 3 30,75	by div. 100 7 0,5 3 30,25	210·401
	545	Pos.	75·60 127·72 77·20 126·32	101·660 102·460 101·760	102·060 102·110	102·085	at div. 100 4 17 43 21 25 24 43,5	at div. 105 4 17 56 21 11,5 24 57,5	by div. 100 7 0,5 3 30,25	by div. 105 7 1,5 3 30,75	210·458
	546	Neg.	126·32 71·60 124·70 73·10	98·960 98·150 98·900	98·555 98·525	98·540	at div. 95 4 28 31,5 31 44 35 32,5	at div. 100 4 28 19 31 56,5 35 19	by div. 95 7 1,0 3 30,5	by div. 100 7 0,0 3 30,0	210·146
	547	Pos.	73·10 130·20 74·90 128·68	101·650 102·550 101·790	102·100 102·170	102·135	at div. 100 4 38 51 42 30 45 51	at div. 105 4 39 3 42 16 46 3,5	by div. 100 7 0,0 3 30,00	by div. 105 7 0,5 3 30,25	210·107
T = 64·63 B = 30·080	548	Neg.	128·68 69·40 126·92 71·10	99·040 98·160 99·010	98·600 98·585	98·592	at div. 95 4 49 37 52 50,5 56 38	at div. 100 4 49 25,5 53 2 56 26	by div. 95 7 1,0 3 30,50	by div. 100 7 0,5 3 30,25	210·320
April 30 T = 62·37 B = 30·216	549	Pos.	101·60 105·20 101·76 105·08	103·400 103·480 103·420	103·440 103·450	103·445	at div. 103 11 8 48 12 49 15 43	at div. 104 1 9 27 12 11 16 23	by div. 103 6 55,0 3 27,5	by div. 104 6 56,0 3 28,0	207·722
	550	Neg.	105·08 94·90 104·70 95·10	99·990 99·800 99·900	99·895 99·850	99·872	at div. 99 *11 19 38,5 22 52 26 43	at div. 100 1 19 25 23 5,5 26 29	by div. 99 7 4,5 3 32,25	by div. 100 7 4,0 3 32,00	212·032
	551	Pos.	95·10 111·30 95·50 110·98	103·200 103·400 103·240	103·300 103·320	103·310	at div. 103 11 30 2 33 35 36 56,5	at div. 104 11 30 10,5 33 27 37 5,5	by div. 103 6 54.5 3 27,25	by div. 104 6 55,0 3 27,50	207·327
	552	Neg.	110·98 88·92 110·50 89·40	99·950 99·710 99·950	99·830 99·830	99·830	at div. 99 11 40 37 43 54 47 33	at div. 100 11 40 31 44 1 47 27	by div. 99 6 56,0 3 28,0	by div. 100 6 56.0 3 28,0	208·000
	553	Pos.	89·40 116·98 90·08 116·48	103·190 103·530 103·280	103·360 103·405	103·382	at div. 102 11 50 53 54 34 57 48	at div. 104 11 51 2,5 54 24,5 57 58	by div. 102 6 55,0 3 27,50	by div. 104 6 55,5 3 27,75	207,673
Continued.	554	Neg.	116·48 83·48 115·66 84·08	99·980 99·570 99·870	99·775 99·720	99·747	at div. 98 0 1 33,5 4 47 8 30	at div. 100 0 1 25,5 4 55 8 21,5	by div. 98 6 56.5 3 28,25	by div. 100 6 56,0 3 28,00	208·032

11th Series continued.—2-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	555	Pos.	84·08 122·20 84·80 121·52	103·140 103·500 103·160	103·320 103·330	103·325	at div. 102 0 11 49 15 27 18 46	at div. 104 0 11 56 15 20 18 53,5	by div. 102 6 57,0 3 28,50	by div. 104 6 57,5 3 28,75	208,666
T = 62·65 B = 30·200	556	Neg.	121·52 78·76 120·08 79·64	100·140 99·420 99·860	99·780 99·640	99·710	at div. 98 0 22 28 26 44,5 29 27	at div. 100 0 22 22 26 51 29 20,5	by div. 98 6 59,0 3 29,50	by div. 100 6 58,5 3 29,25	209,286
May 1 T = B =	557	Neg.	104·00 96·90 103·80 97·10	100·450 100·350 100·450	100·400 100·400	100·400	at div. 100 4 17 8 20 23 24 9	at div. 101 4 16 49 20 41,5 23 49	by div. 100 7 1,0 3 30,5	by div. 101 7 0,0 3 30,0	210,300
	558	Pos.	97·10 110·58 97·50 110·20	103·840 104·040 103·850	103·940 103·945	103·942	at div. 103 4 27 32 31 22 34 31,5	at div. 104 4 27 42 31 11 34 42,5	by div. 103 6 59,5 3 29,75	by div. 104 7 0,5 3 30,25	210,221
	559	Neg.	110·20 90·90 109·60 91·32	100·550 100·250 100·460	100·400 100·355	100·377	at div. 100 4 38 20 41 45 45 21	at div. 101 4 38 13 41 52 45 13,5	by div. 100 7 1,0 3 30,50	by div. 101 7 0,5 3 30,25	210,406
	560	Pos.	91·32 116·00 92·20 115·28	103·660 104·100 103·740	103·880 103·920	103·900	at div. 103 4 48 49 52 30 55 50	at div. 104 4 48 54,5 52 25 55 56	by div. 103 7 1,0 3 30,50	by div. 104 7 1,5 3 30,75	210,725
	561	Neg.	115·28 85·80 114·28 86·62	100·540 100·040 100·450	100·290 100·245	100·267	at div. 100 4 59 31 5 2 58 6 32	at div. 102 4 59 21,5 5 3 8 6 22	by div. 100 7 1,0 3 30,50	by div. 102 7 0,5 3 30,25	210,467
	562	Pos.	86·62 120·46 87·72 119·40	103·540 104·090 103·560	103·815 103·825	103·820	at div. 102 5 9 56,5 13 42,5 16 57,5	at div. 104 5 10 4,5 13 34,5 17 6	by div. 102 7 1,0 3 30,50	by div. 104 7 1,5 3 30,75	210,727
	563	Neg.	119·40 81·60 118·20 82·70	100·500 99·900 100·450	100·200 100·175	100·187	at div. 100 5 20 39,5 24 8,5 27 41	at div. 102 5 20 32,5 24 16 27 33,5	by div. 100 7 1,5 3 30,75	by div. 102 7 1,0 3 30,50	210,727
T = 63·10 B = 29·912	564	Pos.	82·70 124·00 84·10 122·90	103·350 104·050 103·500	103·700 103·775	103·737	at div. 102 5 31 8 missed. 38 8,5	at div. 104 5 31 14,5 missed. 38 15,5	by div. 102 7 0,5 3 30,25	by div. 104 7 1,0 3 30,50	210,467
May 2 T = 62·33 B = 29·726	565	Neg.	111·48 89·40 110·80 89·90	100·440 100·100 100·350	100·270 100·225	100·247	at div. 100 9 54 36,5 58 2 10 1 32,5	at div. 101 9 54 30 58 7 10 1 26	by div. 100 6 56,0 3 28,0	by div. 101 6 56,0 3 28,0	208,000
Continued.	566	Pos.	89·90 117·26 90·60 116·70	103·580 103·930 103·650	103·755 103·790	103·772	at div. 103 10 4 50,5 8 36 11 56	at div. 104 10 4 55,5 8 31 12 1	by div. 103 7 5,5 3 32,75	by div. 104 7 5,5 3 32,75	212,750

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m, s	m s	m s	
Continued.	567	Neg.	116·70 84·34 116·02 85·10	100·520 100·180 100·560	100·350 100·370	100·360	at div. 100 10 15 34 18 59 22 31	at div. 102 10 15 25,5 19 7,5 22 22	by div. 100 6 57,0 3 28,50	by div. 102 6 56,5 3 28,25	208,465
	568	Pos.	85·10 122·34 86·10 121·70	103·720 104·220 103·900	103·970 104·060	104·015	at div. 104 10 26 1 29 30 32 58	at div. 106 10 26 8 29 22 33 5,5	by div. 104 6 57,0 3 28,50	by div. 106 6 57,5 3 28,75	208,502
	569	Neg.	121·70 79·90 120·88 80·70	100·800 100·390 100·790	100·595 100·590	100·592	at div. 100 10 36 31 39 56 43 29	at div. 102 10 36 24,5 40 3 43 22	by div. 100 6 58,0 3 29,00	by div. 102 6 57,5 3 28,75	208,926
	570	Pos.	80·70 127·04 81·80 126·20	103·870 104·420 104·000	104·145 104·210	104·177	at div. 104 10 46 58 50 28 53 56	at div. 106 10 47 4 50 22,5 54 2	by div. 104 6 58,0 3 29,0	by div. 106 6 58,0 3 29,0	209,000
	571	Neg.	126·20 75·72 125·18 76·62	100·960 100·450 100·900	100·705 100·675	100·690	at div. 100 10 57 29,5 11 0 55 4 28	at div. 105 10 57 16 11 1 8,5 4 14	by div. 100 6 58,5 3 29,25	by div. 105 6 58,0 3 29,00	209,216
	572	Pos.	76·62 131·20 77·72 130·18	103·910 104·460 103·950	104·185 104·205	104·195	at div. 100 11 7 47 11 37,5 14 45,5	at div. 105 11 7 59 11 25 14 58	by div. 100 6 58,5 3 29,25	by div. 105 6 59,0 3 29,50	209,460
	573	Neg.	130·18 71·80 128·92 72·90	100·990 100·360 100·910	100·675 100·635	100·655	at div. 100 11 18 29,5 21 56 25 29	at div. 105 11 18 18 22 7,5 25 17	by div. 100 6 59,5 3 29,75	by div. 105 6 59,0 3 29,50	209,717
	574	Pos.	72·90 134·80 74·22 133·68	103·850 104·510 103·950	104·180 104·230	104·205	at div. 100 11 28 50 32 38,5 35 49	at div. 105 11 29 0,5 32 27 36 0	by div. 100 6 59,0 3 29,50	by div. 105 6 59,5 3 29,75	209,710
	575	Neg.	133·68 68·40 132·30 69·62	101·040 100·350 100·960	100·695 100·655	100·675	at div. 100 11 39 32 42 59 46 31,5	at div. 105 11 39 21,5 43 9,5 46 20,5	by div. 100 6 59,5 3 29,75	by div. 105 6 59,0 3 29,50	209,716
	576	Pos.	69·62 138·10 71·20 136·70	103·860 104·650 103·950	104·255 104·300	104·277	at div. 100 11 49 54 53 41 56 53,5	at div. 105 11 50 3,5 53 31 57 3,5	by div. 100 6 59,5 3 29,75	by div. 105 7 0,0 3 30,00	209,964
	577	Neg.	136·70 65·40 135·10 66·90	101·050 100·250 101·000	100·650 100·625	100·637	at div. 100 0 0 45 3 53,5 7 45,5	at div. 105 0 0 35,5 4 3 7 35,5	by div. 100 7 0,5 3 30,25	by div. 105 7 0,0 3 30,00	210,218
Continued.	578	Pos.	66·90 140·70 68·52 139·20	103·800 104·610 103·860	104·205 104·235	104·220	at div. 100 0 10 58 14 44 17 58	at div. 105 0 11 7,5 14 34,5 18 8,0	by div. 100 7 0,0 3 30,00	by div. 105 7 0,5 3 30,25	210,211

11th SERIES continued.—2-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	579	Neg.	139·20 63·12 137·30 64·80	101·160 100·210 101·050	100·685 100·630	100·657	at div. 100 0 21 39,5 25 7,5 28 40	at div. 105 0 21 30,5 25 16,5 28 30,5	by div. 100 7 0,5 3 30,25	by div. 105 7 0,0 3 30,00	* 210,217
T=63·10 B=29·732	580	Pos.	64·80 142·80 66·62 141·04	103·800 104·710 103·830	104·255 104·270	104·262	at div. 100 0 32 3 35 48 39 3	at div. 105 0 32 11,5 35 39 39 12	by div. 100 7 0,0 3 30,00	by div. 105 7 0,5 3 30,25	210,213

12th SERIES.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
May 4 T=57·27 B=29·650	581	Pos.	101·60 103·90 101·80 103·80	102·750 102·850 102·800	102·800 102·825	102·812	at div. 102 10 24 38 29 8 30 13	at div. 103 10 25 33 28 6 31 17	by div. 102 5 35,0 2 47,5	by div. 103 5 44,0 2 52,0	171,154
	582	Neg.	103·80 97·40 103·32 97·90	100·600 100·360 100·610	100·480 100·485	100·482	at div. 100 10 34 21 36 54 40 7	at div. 101 10 34 3 37 13 39 46	by div. 100 5 46,0 2 53,0	by div. 101 5 43,0 2 51,5	172,277
	583	Pos.	97·90 107·42 98·62 106·92	102·660 103·020 102·770	102·840 102·895	102·867	at div. 102 10 42 48 46 1,5 48 30	at div. 103 10 42 59,5 45 49 48 43	by div. 102 5 42,0 2 51,00	by div. 103 5 43,5 2 51,75	171,650
	584	Neg.	106·92 94·78 106·06 95·48	100·850 100·420 100·770	100·635 100·595	100·615	at div. 100 10 51 47 54 28 57 32	at div. 101 10 51 38 54 37 57 21,5	by div. 100 5 45,0 2 52,50	by div. 101 5 43,5 2 51,75	172,039
	585	Pos.	95·48 109·80 96·50 108·96	102·640 103·150 102·730	102·895 102·940	102·917	at div. 102 11 0 18 3 26 6 2	at div. 104 11 0 34 3 8 6 20,5	by div. 102 5 44,0 2 52,00	by div. 104 5 46,5 2 53,25	172,573
	586	Neg.	108·96 92·88 107·84 93·70	100·920 100·360 100·770	100·640 100·565	100·602	at div. 100 11 9 12 11 55 14 57	at div. 102 11 8 58,5 12 11 14 41,5	by div. 100 5 45,0 2 52,5	by div. 102 5 43,0 2 51,5	172,199
	587	Pos.	93·70 111·44 94·82 110·34	102·570 103·130 102·580	102·850 102·855	102·852	at div. 102 11 17 43,5 20 48 23 28,5	at div. 104 11 17 56 20 35 23 43	by div. 102 5 45,0 2 52,5	by div. 104 5 47,0 2 53,5	172,926
	588	Neg.	110·34 91·20 108·94 92·12	100·770 100·070 100·530	100·420 100·300	100·360	at div. 100 11 26 36 29 24 32 21,5	at div. 102 11 26 24 29 36,5 32 8	by div. 100 5 45,5 2 52,75	by div. 102 5 44,0 2 52,00	172,615
Continued.	589	Pos.	92·12 112·28 93·28 110·98	102·200 102·780 102·130	102·490 102·455	102·472	at div. 102 11 35 13,5 38 13 41 1	at div. 104 11 35 25 38 1 41 14	by div. 102 5 47,5 2 53,75	by div. 104 5 49,0 2 54,50	173,927

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	590	Neg.	110·98 89·60 109·40 90·50	100·290 99·500 99·950	99·895 99·725	99·810	at div. 98 11 44 11 46 43,5 49 58	at div. 100 11 44 0,5 46 55 49 46	by div. 98 5 47,0 2 53,50	by div. 100 5 45,5 2 52,75	172,821
	591	Pos.	90·50 112·68 91·58 111·36	101·590 102·130 101·470	101·860 101·800	101·830	at div. 100 11 52 34,5 missed. 58 22	at div. 102 11 52 45 missed. 58 33,5	by div. 100 5 47,5 2 53,75	by div. 102 5 48,5 2 54,25	174,207
	592	Neg.	111·36 88·00 109·90 88·90	99·680 98·950 99·400	99·315 97·175	99·245	at div. 98 0 1 36 4 17 7 23,5	at div. 100 0 1 26 4 27 7 13	by div. 98 5 47,5 2 53,75	by div. 100 5 47,0 2 53,50	173,594
	593	Pos.	88·90 113·30 90·20 112·20	101·100 101·750 101·200	101·425 101·475	101·450	at div. 100 0 10 8 13 16 15 55,5	at div. 102 0 10 17 13 6 16 5,5	by div. 100 5 47,5 2 53,75	by div. 102 5 48,5 2 54,25	174,112
T=57·51 B=29·600	594	Neg.	112·20 86·70 110·80 88·08	99·450 98·750 99·440	99·100 99·095	99·097	at div. 98 0 19 5,5 21 50 24 54	at div. 100 0 18 56,5 21 59 24 44	by div. 98 5 48,5 2 54,25	by div. 100 5 47,5 2 53,75	173,976
May 6 T=60·50 B=29·672	595	Neg.	108·20 95·06 107·44 95·78	101·630 101·250 101·610	101·440 101·430	101·435	at div. 101 2 35 27,5 38 17,5 41 26	at div. 102 2 35 19 38 27 41 16	by div. 101 5 58,5 2 59,25	by div. 102 5 57,0 2 58,50	178,924
	596	Pos.	95·78 111·50 96·70 110·50	103·640 104·100 103·600	103·870 103·850	103·860	at div. 103 2 44 19 47 31,5 50 16	at div 104 2 44 26 47 24 50 24,5	by div. 103 5 57,0 2 58,50	by div. 104 5 58,5 2 59,25	179,145
	597	Neg.	110·50 92·68 109·20 93·68	101·590 100·940 101·440	101·265 101·190	101·227	at div. 100 2 53 35,5 missed. 59 33,5	at div. 102 2 53 22,5 missed. 59 19	by div. 100 5 58,0 2 59,00	by div. 102 5 56,5 2 58,25	178,540
	598	Pos.	93·68 112·92 94·90 111·70	103·300 103·910 103·300	103·605 103·605	103·605	at div. 102 3 2 18 5 37 8 15	at div. 104 3 2 30 5 23 8 28,5	by div. 102 5 57,0 2 58,50	by div. 104 5 58,5 2 59,25	179,102
	599	Neg.	111·70 91·10 110·30 92·30	101·400 100·700 101·300	101·050 101·000	101·025	at div. 100 3 11 35 14 22,5 17 34	at div. 102 3 11 23,5 14 34 17 21	by div. 100 5 59,0 2 59,50	by div. 102 5 57,5 2 58,75	179,116
	600	Pos.	92·30 113·82 93·80 112·40	103·060 103·810 103·100	103·435 103·455	103·445	at div. 102 3 20 22,5 23 38,5 26 20,5	at div. 104 3 20 33,5 23 27 26 33	by div. 102 5 58,0 2 59,00	by div. 104 5 59,5 2 59,75	179,542
Continued.	601	Neg.	112·40 90·12 110·80 91·60	101·260 100·460 101·200	100·860 100·830	100·845	at div. 100 3 29 37 32 27,5 35 36,5	at div. 102 3 29 27 32 39 35 24,5	by div. 100 5 59,5 2 59,75	by div. 102 5 57,5 2 58,75	179,328

12th SERIES continued.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	602	Pos.	91·60 114·30 93·08 112·70	102·950 103·690 102·890	103·320 103·290	103·305	at div. 102 3 38 27 41 40 44 25	at div. 104 3 38 37 41 29 44 37	by div. 102 5 58,0 2 59,0	by div. 104 6 0,0 3 0,0	179,652
	603	Neg.	112·70 89·50 111·10 91·00	101·100 100·300 101·050	100·700 100·675	100·687	at div. 100 3 47 38 50 30 53 37.5	at div. 102 3 47 28 50 41 53 26	by div. 100 5 59,5 2 59,75	by div. 102 5 58,0 2 59,00	179,493
	604	Pos.	91·00 114·40 92·80 112·84	102·700 103·600 102·820	103·150 103·210	103·180	at div. 102 3 56 31,5 59 43 4 2 29,5	at div. 104 3 56 41,5 59 33 4 2 41	by div. 102 5 58,0 2 59,00	by div. 104 5 59,5 2 59,75	179,442
	605	Neg.	112·84 89·48 111·00 90·90	101·160 100·240 100·950	100·700 100·595	100·647	at div. 100 4 5 43.5 8 36 11 43	at div. 102 4 5 33,5 8 47,5 11 31,5	by div. 100 5 59.5 2 59.75	by div. 102 5 58,0 2 59,00	179,508
	606	Pos.	90·90 114·40 92·68 112·86	102·650 103·540 102·770	103·095 103·155	103·125	at div. 102 4 14 37 17 41 20 35	at div. 104 4 14 47 17 23 20 46,5	by div. 102 5 58,0 2 59,00	by div. 104 5 59,5 2 59,75	179,422
	607	Neg.	112·86 89·32 111·02 90·90	101·090 100·170 100·960	100·630 100·565	100·597	at div. 100 4 23 48 26 41 29 47,5	at div. 102 4 23 38,5 26 52 29 36	by div. 100 5 59,5 2 59,75	by div. 102 5 57,5 2 58,75	179,452
T = 61·15 B = 29·730	608	Pos.	90·90 114·48 92·60 112·90	102·690 103·540 102·750	103·115 103·145	103·130	at div. 102 4 32 41,5 35 52 38 39	at div. 104 4 32 51 35 42 38 50,5	by div. 102 5 57.5 2 58,75	by div. 104 5 59.5 2 59,75	179,315
May 7 T = 59·85 B = 29·748	609	Pos.	91·00 114·20 92·30 112·90	102·600 103·250 102·600	102·925 102·925	102·925	at div. 102 10 27 7,5 30 10 32 53,5	at div. 104 10 27 17 30 0 33 4	by div. 102 5 46,0 2 53,0	by div. 104 5 47,0 2 53,5	173,231
	610	Neg.	112·90 88·76 111·30 89·90	100·830 100·030 100·600	100·430 100·315	100·372	at div. 100 10 35 56,5 38 46 41 42,5	at div. 102 10 35 47 38 56 41 32	by div. 100 5 46,0 2 53.0	by div. 102 5 45,0 2 52,5	172,907
	611	Pos.	89·90 114·52 91·24 113·22	102·210 102·880 102·230	102·545 102·555	102·550	at div. 102 10 44 34,5 missed. 50 21	at div. 104 10 44 43,5 missed. 50 31	by div. 102 5 46,5 2 53,25	by div. 104 5 47,5 2 53,75	173,387
	612	Neg.	113·22 87·90 111·68 89·12	100·560 99·790 100·400	100·175 100·095	100·135	at div. 100 10 53 22 56 14 59 9	at div. 102 10 53 13,5 56 23.5 58 59	by div. 100 5 47,0 2 53,50	by div. 102 5 45.5 2 52,75	173,451
Continued.	613	Pos.	89·12 114·96 90·68 113·70	102·040 102·820 102·190	102·430 102·505	102·467	at div. 102 11 2 3 5 1,5 7 51	at div. 104 11 2 12 4 52,5 8 1	by div. 102 5 48,0 2 54,0	by div. 104 5 49,0 2 54.5	174,117

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	614	Neg.	113·70 87·40 112·32 88·64	100·550 99·860 100·480	100·205 100·170	100·187	at div. 100 11 10 52 13 44 16 41	at div. 102 11 10 43 13 53 16 31	by div. 100 5 49,0 2 54,5	by div. 102 5 48,0 2 54,0	174,453
	615	Pos.	88·64 115·72 90·00 114·82	102·180 102·860 102·410	102·520 102·635	102·577	at div. 102 11 19 35 22 35 25 24	at div. 104 11 19 43 22 26 25 33	by div. 102 5 49,0 2 54,5	by div. 104 5 50,0 2 55,0	174·644
	616	Neg.	114·82 86·60 113·52 87·82	100·710 100·060 100·670	100·385 100·365	100·375	at div. 100 11 28 27 31 19 34 19	at div. 102 11 28 19 31 27,5 34 10	by div. 100 5 52,0 2 56,0	by div. 102 5 51,0 2 55,5	175,906
	617	Pos.	87·82 116·90 89·50 115·48	102·360 103·200 102·490	102·780 102·845	102·812	at div. 102 11 37 13,5 40 16,5 43 6,5	at div. 104 11 37 21 40 8,5 43 15	by div. 102 5 53,0 2 56,5	by div. 104 5 54,0 2 57,0	176,703
	618	Neg.	115·48 86·10 113·90 87·50	100·790 100·000 100·700	100·395 100·350	100·372	at div. 100 11 46 11 49 5 52 6	at div. 102 11 46 3 49 13 51 57	by div. 100 5 55,0 2 57,5	by div. 102 5 54.0 2 57,0	177,407
	619	Pos.	87·50 117·30 89·10 115·70	102·400 103·200 102·400	102·800 102·800	102·800	at div. 102 11 55 0,5 58 5 0 0 55,5	at div. 104 11 55 8 57 57 0 1 4	by div. 102 5 55,0 2 57,5	by div. 104 5 56,0 2 58,0	177,700
	620	Neg.	115·70 85·50 114·00 86·94	100·600 99·750 100·470	100·175 100·110	100·142	at div. 100 0 4 0,5 missed. 9 57,5	at div. 102 0 3 53 missed. 9 49	by div. 100 5 57,0 2 58,5	by div. 102 5 56,0 2 58,0	178,465
	621	Pos.	86·94 117·30 88·60 115·60	102·120 102·950 102·100	102·535 102·525	102·530	at div. 102 0 12 55,5 15 58,5 18 51,5	at div. 104 0 13 3 15 50,5 19 0	by div. 102 5 56,0 2 58,0	by div. 104 5 57,0 2 58,5	178,132
T=60·27 B=29·720	622	Neg.	115·60 85·16 114·00 86·50	100·380 99·580 100·250	99·980 99·915	99·947	at div. 98 0 22 2 24 44,5 27 59	at div. 100 0 21 54,5 24 52,5 27 50,5	by div. 98 5 57,0 2 58,5	by div. 100 5 56,0 2 58,0	178,013
May 8 T=60·58 B=29·550	623	Pos.	97·00 109·20 97·72 108·50	103·100 103·460 103·110	103·280 103·285	103·282	at div. 102 7 11 20 14 39 17 6	at div. 104 7 11 38,5 14 19 17 27	by div. 102 5 46,0 2 53,00	by div. 104 5 48,5 2 54,25	173,801
	624	Neg.	108·50 93·95 107·44 94·70	101·225 100·695 101·070	100·960 100·882	100·921	at div. 100 7 20 24,5 23 19 26 11	at div. 102 7 20 9 23 36 25 53	by div. 100 5 46,5 2 53,25	by div. 102 5 44,0 2 52,00	172·675
Continued.	625	Pos.	94·70 111·08 95·90 110·22	102·890 103·490 103·060	103·190 103·275	103·232	at div. 102 7 28 53 32 3,5 34 37	at div. 104 7 29 7 31 49 34 53	by div. 102 5 44,0 2 52,0	by div. 104 5 46,0 2 53,0	172,616

12th Series continued.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	626	Neg.	110·22 92·30 109·00 93·32	101·260 100·650 101·160	100·955 100·906	100·930	at div. 100 7 37 52 40 33 43 39	at div. 102 7 37 39,5 40 46 43 25	by div. 100 5 47,0 2 53,50	by div. 102 5 45,5 2 52,75	s 173,151
	627	Pos.	93·32 112·48 94·60 111·38	102·900 103·540 102·990	103·220 103·265	103·242	at div. 102 7 46 23 49 32 52 9	at div. 104 7 46 35 49 19 52 22	by div. 102 5 46,0 2 53,0	by div. 104 5 47,0 2 53,5	173,310
	628	Neg.	111·38 91·00 109·98 92·00	101·190 100·490 100·990	100·840 100·740	100·790	at div. 100 7 55 19 58 3,5 8 1 5,5	at div. 102 7 55 8 58 15 8 0 53	by div. 100 5 46,5 2 53,25	by div. 102 5 45,0 2 52,50	172,954
	629	Pos.	92·00 113·40 93·36 112·28	102·700 103·380 102·820	103·040 103·100	103·070	at div. 102 8 3 52,5 6 57 9 38	at div. 104 8 4 3 6 46 9 50	by div. 102 5 45,5 2 52,75	by div. 104 5 47,0 2 53,50	173,151
T = 60·58 B = 29·500	630	Neg.	112·28 89·90 110·88 91·20	101·090 100·390 101·040	100·740 100·715	100·727	at div. 100 8 12 45 15 31 18 32,5	at div. 102 8 12 35 15 42 18 21	by div. 100 5 47,5 2 53,75	by div. 102 5 46,0 2 53,00	173,478

13th Series.—2-inch *Glass* balls (loaded), with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
May 9 T = 58·63 B = 30·090	631	Pos.	98·00 104·70 98·22 104·50	101·350 101·460 101·360	101·405 101·410	101·407	at div. 101 10 25 43 27 49 29 36	at div. 102 10 25 54 27 37,5 29 48	by div. 101 3 53,0 1 56,5	by div. 102 3 54,0 1 57,0	116,703
	632	Neg.	104·50 96·40 104·08 96·80	100·450 100·240 100·440	100·345 100·340	100·342	at div. 100 10 31 44 33 34 35 37	at div. 101 10 31 34 33 44 35 27	by div. 100 3 53,0 1 56,5	by div. 101 3 53,0 1 56,5	116,500
	633	Pos.	96·80 105·70 97·28 105·34	101·250 101·490 101·310	101·370 101·400	101·375	at div. 101 10 37 33 39 35,5 41 25	at div. 102 10 37 41,5 39 26,5 41 34,5	by div. 101 3 52,0 1 56,0	by div. 102 3 53,0 1 56,5	116,187
	634	Neg.	105·34 95·50 104·88 95·90	100·420 100·190 100·390	100·305 100·290	100·297	at div. 100 10 43 31 45 23 47 24	at div. 101 10 43 23 45 31 47 16	by div. 100 3 53,0 1 56,5	by div. 101 3 53,0 1 56,5	116,500
	635	Pos.	95·90 106·50 96·40 106·10	101·200 101·450 101·250	101·325 101·350	101·337	at div. 101 10 49 19 51 21 53 12	at div. 102 10 49 26 51 13 53 19,5	by div. 101 3 53,0 1 56,50	by div. 102 3 53,5 1 56,75	116,584
Continued.	636	Neg.	106·10 94·80 105·54 95·20	100·450 100·170 100·370	100·310 100·270	100·290	at div. 100 10 55 16 57 9 59 10	at div. 101 10 55 9 57 16 59 3	by div. 100 3 54,0 1 57,0	by div. 101 3 54,0 1 57,0	117,000

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	637	Pos.	95·20 107·12 95·80 106·70	101·160 101·460 101·250	101·310 101·355	101·332	at div. 100 11 0 58 3 13 4 51,5	at div. 102 11 1 11,5 3 0 5 5	by div. 100 5 53,5 1 56,75	by div. 102 5 53,5 1 56,75	116,750
	638	Neg.	106·70 94·26 106·12 94·68	100·480 100·190 100·400	100·335 100·295	100·315	at div. 100 11 7 2,5 8 55 10 56	at div. 102 11 6 50 9 8 10 43	by div. 100 3 53,5 1 56,75	by div. 102 3 53,0 1 56,50	116,711
	639	Pos.	94·68 107·70 95·20 107·30	101·190 101·450 101·250	101·320 101·350	101·335	at div. 100 11 12 45 14 58 16 38	at div. 102 11 12 57 14 46 16 50,5	by div. 100 3 53,0 1 56,50	by div. 102 3 53,5 1 56,75	116,667
	640	Neg.	107·30 93·58 106·80 94·10	100·440 100·190 100·450	100·315 100·320	100·317	at div. 100 11 18 48 20 41 22 41	at div. 102 11 18 37 20 52 22 29,5	by div. 100 3 53,0 1 56,50	by div. 102 3 52,5 1 56,25	116,460
	641	Pos.	94·10 108·44 94·72 107·92	101·270 101·580 101·320	101·425 101·450	101·437	at div. 100 11 24 31 26 44 28 24	at div. 102 11 24 42 26 33 28 36	by div. 100 3 53,0 1 56,5	by div. 102 3 54,0 1 57,0	116,859
	642	Neg.	107·92 93·20 107·30 93·62	100·560 100·250 100·460	100·405 100·355	100·380	at div. 100 11 30 35 32 27,5 34 29	at div. 102 11 30 24,5 32 38 34 18	by div. 100 3 54,0 1 57,00	by div. 102 3 53,5 1 56,75	116,953
	643	Pos.	93·62 108·90 94·38 108·40	101·260 101·640 101·390	101·450 101·515	101·482	at div. 100 11 36 19 38 31,5 40 12	at div. 102 11 36 29 38 21 40 23	by div. 100 3 53,0 1 56,5	by div. 102 2 54,0 1 57,0	116,870
T = 58·83 B = 30·160	644	Neg.	108·40 92·70 107·82 93·30	100·550 100·260 100·560	100·405 100·410	100·407	at div. 100 11 42 22 44 14,5 46 16,5	at div. 102 11 42 12 44 24,5 46 6	by div. 100 3 54,5 1 57,25	by div. 102 3 54,0 1 57,00	117,199
May 10 T = 59·51 B = 30·200	645	Pos.	95·20 105·40 95·72 105·00	100·300 100·560 100·360	100·430 100·460	100·445	at div. 100 10 6 0,5 8 5 9 55	at div. 101 10 6 8 7 58 10 3	by div. 100 3 54,5 1 57,25	by div. 101 3 55,0 1 57,50	117,361
	646	Neg.	105·00 94·00 104·60 94·40	99·500 99·300 99·500	99·400 99·400	99·400	at div. 99 10 12 3,5 13 55 15 59	at div. 100 10 11 56 14 2 15 51	by div. 99 3 55,5 1 57,75	by div. 100 3 55,0 1 57,50	117,650
	647	Pos.	94·40 106·40 94·92 106·10	100·400 100·660 100·510	100·530 100·585	100·557	at div. 100 10 17 51,5 missed. 21 45	at div. 101 10 17 58 missed. 21 52,5	by div. 100 3 53,5 1 56,75	by div. 101 3 54,5 1 57,25	117,028
Continued.	648	Neg.	106·10 93·20 105·64 93·70	99·650 99·420 99·670	99·535 99·545	99·540	at div. 99 10 23 53 missed. 27 48,5	at div. 100 10 23 47 missed. 27 42	by div. 99 3 55,5 1 57,75	by div. 100 3 55,0 1 57,50	117,615

13th SERIES cont.—2-inch *Glass* balls (loaded), with bifilar *iron* wire; dist. = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	649	Pos.	93·70 107·28 94·22 106·70	100·490 100·730 100·460	100·620 100·603	100·612	at div. 100 10 29 42 31 47 33 36	at div. 102 10 29 53 31 33 33 48	by div. 100 3 54,0 1 57,0	by div 102 3 55,0 1 37,5	* 117,153
	650	Neg.	106·70 92·60 106·20 93[illegible]8	99·650 99·400 99·640	99·325 99·520	99·322	at div. 98 10 35 30 37 30 39 46	at div. 100 10 35 39 37 41,5 39 34	by div. 98 3 56,0 1 38,0	by div. 100 3 55,0 1 57,3	117,620
	631	Pos.	93·08 107·90 93·68 107·40	100·490 100·790 100·540	100·640 100·663	100·632	at div. 100 10 41 33 43 38 45 28	at div. 102 10 41 43,3 43 27 45 39,3	by div. 100 3 53,0 1 37,5	by div. 102 3 36,0 1 58,0	117,663
	652	Neg.	107·40 92·10 106·88 92·54	99·730 99·490 99·710	99·620 99·600	99·610	at div. 98 10 47 39,3 49 20,5 51 33	at div. 100 10 47 29,3 49 31 51 24,5	by div. 98 3 55,5 1 57,75	by div. 100 3 53,0 1 37,50	117,349
	633	Pos.	92·54 108·52 93·26 108·02	100·530 100·890 100·640	100·710 100·765	100·737	at div. 100 10 53 22,5 33 28 57 17	at div. 102 10 53 32 35 17,3 37 27,5	by div. 100 3 54,5 1 37,25	by div. 102 3 55,5 1 37,75	117,434
	634	Neg.	108·02 91·60 107·48 92·18	99·810 99·540 99·830	99·675 99·683	99·680	at div. 98 10 59 28 11 1 10 3 24,5	at div. 100 10 59 19 11 1 20 3 14,5	by div. 98 3 56,5 1 58,25	by div. 100 3 55,5 1 37,75	117,830
	653	Pos.	92·18 109·04 92·88 108·52	100·610 100·960 100·700	100·783 100·830	100·807	at div. 100 11 3 12 7 17 9 7	at div. 102 11 5 21 7 8 9 17	by div. 100 3 55,0 1 57,5	by div. 102 3 56,0 1 58,0	117,702
	636	Neg.	108·52 91·34 107·88 91·90	99·930 99·610 99·890	99·770 99·750	99·760	at div. 98 11 11 19 13 1,3 15 15	at div. 100 11 11 10,3 13 10,5 15 6	by div. 98 3 36,0 1 58,00	by div. 100 3 55,5 1 57,75	117,780
	657	Pos.	91·90 109·48 92·52 108·90	100·690 101·000 100·710	100·845 100·833	100·850	at div. 100 11 17 2,3 19 8 20 57,5	at div. 102 11 17 11 18 59 21 7	by div. 100 3 53,0 1 57,5	by div. 102 3 56,0 1 38,0	117,712
	658	Neg.	108·90 91·12 108·20 91·70	100·010 99·660 99·950	99·833 99·805	99·820	at div. 98 11 23 9,5 24 51,3 27 3,5	at div. 100 11 23 0,5 23 0 26 36	by div. 98 3 56,0 1 38,00	by div. 100 3 55,5 1 37,73	117,773
	659	Pos.	91·70 109·72 92·40 109·20	100·710 101·060 100·800	100·885 100·930	100·907	at div. 100 11 28 53 30 58,5 32 48	at div. 102 11 29 1,5 30 50 32 57	by div. 100 3 53,0 1 37,30	by div. 102 3 53,5 1 57,73	117,613
Continued.	660	Neg.	109·20 90·90 108·48 91·50	100·050 99·690 99·990	99·870 99·840	99·835	at div. 98 11 35 0 36 41 38 56	at div. 100 11 34 51,5 36 30 38 47	by div. 98 3 56,0 1 38,00	by div. 100 3 53,5 1 37,73	117,768

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	661	Pos.	91·50 109·98 92·36 109·40	100·740 101·170 100·880	100·955 101·025	100·990	at div. 100 11 40 43 42 50 44 37,5	at div. 102 11 40 51,5 42 41 44 46	by div. 100 3 54,5 1 57,25	by div. 102 3 54,5 1 57,25	117,250
	662	Neg.	109·40 90·90 108·68 91·60	100·150 99·790 100·140	99·970 99·965	99·967	at div. 98 11 46 49,5 48 31 50 46	at div. 100 11 46 41,5 48 40 50 37,5	by div. 98 3 56,5 1 58,25	by div. 100 3 56,0 1 58,00	118,004
	663	Pos.	91·60 110·12 92·40 109·50	100·860 101·260 100·950	101·060 101·105	101·082	at div. 100 11 52 33 54 40 56 28	at div. 102 11 52 41 54 31 56 37	by div. 100 3 55,0 1 57,5	by div. 102 3 56,0 1 58,0	117,770
	664	Neg.	109·50 90·92 108·52 91·50	100·210 99·720 100·010	99·965 99·865	99·915	at div. 98 11 58 41 0 0 22 2 36,5	at div. 100 11 58 33 0 0 31 2 28	by div. 98 3 55,5 1 57,75	by div. 100 3 55,0 1 57,50	117,511
	665	Pos.	91·50 110·20 92·50 109·52	100·850 101·350 101·010	101·100 101·180	101·140	at div. 100 0 4 23 6 31 8 19	at div. 102 0 4 31,5 6 22,5 8 27,5	by div. 100 3 56,0 1 58,0	by div. 102 3 56,0 1 58,0	118,000
T = 60·10 B = 30·210	666	Neg.	109·52 91·10 108·62 91·72	100·310 99·860 100·170	100·085 100·015	100·050	at div. 100 0 10 24 12 21 14 20	at div. 102 0 10 15,5 12 29,5 14 10,5	by div. 100 3 56,0 1 58,0	by div. 102 3 55,0 1 57,5	117,988
May 12 T = 62·13 B = 30·210	667	Pos.	94·48 106·94 95·06 106·56	100·710 101·000 100·810	100·855 100·905	100·880	at div. 100 10 3 0 5 9 6 54,5	at div. 102 10 3 12,5 4 56,5 7 8	by div. 100 3 54,5 1 57,25	by div. 102 3 55,5 1 57,75	117,470
	668	Neg.	106·56 93·26 106·16 93·90	99·910 99·710 100·030	99·810 99·870	99·840	at div. 98 10 9 11 10 47,5 13 7,5	at div. 100 10 8 59,5 10 59 12 55	by div. 98 3 56,5 1 58,25	by div. 100 3 55,5 1 57,75	117,790
	669	Pos.	93·90 107·70 94·38 107·30	100·800 101·040 100·840	100·920 100·940	100·930	at div. 100 10 14 52 17 0 18 47	at div. 102 10 15 3,5 16 49 18 59	by div. 100 3 55,0 1 57,50	by div. 102 3 55,5 1 57,75	117,616
	670	Neg.	107·30 92·78 106·68 93·20	100·040 99·730 99·940	99·885 99·835	99·860	at div. 98 10 21 3 22 40,5 24 59	at div. 100 10 20 52 22 51,5 24 47,5	by div. 98 3 56,0 1 58,00	by div. 100 3 55,5 1 57,75	117,768
	671	Pos.	93·20 108·40 93·72 107·92	100·800 101·060 100·820	100·930 100·940	100·935	at div. 100 10 26 43 28 50 30 38	at div. 102 10 26 53 28 40 30 48,5	by div. 100 3 55,0 1 57,50	by div. 102 3 55,5 1 57,75	117,617
Continued.	672	Neg.	107·92 92·20 107·30 92·62	100·060 99·750 99·960	99·905 99·855	99·880	at div. 98 10 32 52 34 31,5 36 48,5	at div. 100 10 32 42,5 34 41,5 36 38	by div. 98 3 56,5 1 58,25	by div. 100 3 55,5 1 57,75	117,780

13th Series cont.—2-inch *Glass* balls (loaded), with bifilar *iron* wire; dist. = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	673	Pos.	92·62 108·94 93·28 108·50	100·780 101·110 100·890	100·945 101·000	100·972	at div. 100 10 38 33,5 40 41 42 28	at div. 102 10 38 43,5 40 31 42 38	by div. 100 3 54,5 1 57,25	by div. 102 3 54,5 1 57,25	117,250
	674	Neg.	108·50 91·70 107·88 92·20	100·100 99·790 100·040	99·945 99·915	99·930	at div. 98 10 44 42 46 22 48 38	at div. 100 10 44 33 46 31 48 28	by div. 98 3 56,0 1 58,0	by div. 100 3 55,0 1 57,5	117,518
	675	Pos.	92·20 109·48 92·90 109·00	100·840 101·190 100·950	101·015 101·070	101·042	at div. 100 10 50 23,5 52 31 54 18.	at div. 102 10 50 32,5 52 22 54 28	by div. 100 3 55,0 1 57,50	by div. 102 3 55,5 1 57,75	117,630
	676	Neg.	109·00 91·40 108·30 91·90	100·200 99·850 100·100	100·025 99·975	100·000	at div. 98 10 56 32 58 12 11 0 28	at div. 100 10 56 23,5 58 21 11 0 19	by div. 98 3 56,0 1 58,00	by div. 100 3 55,5 1 57,75	117,750
	677	Pos.	91·90 109·90 92·60 109·40	100·900 101·250 101·000	101·075 101·125	101·100	at div. 100 11 2 14 4 21 6 8,5	at div. 102 11 2 22,5 4 12,5 6 18	by div. 100 3 54,5 1 57,25	by div. 102 3 55,5 1 57,75	117,525
	678	Neg.	109·40 91·12 108·70 91·70	100·260 99·910 100·200	100·085 100·055	100·070	at div. 100 11 8 14 10 11 12 9	at div. 102 11 8 5,5 10 19 12 0	by div. 100 3 55,0 1 57,50	by div. 102 3 54,5 1 57,25	117,491
	679	Pos.	91·70 110·30 92·40 109·72	101·000 101·350 101·060	101·175 101·205	101·190	at div. 100 11 14 3,5 16 11 17 58	at div. 102 11 14 12 16 3 18 7	by div. 100 3 54,5 1 57,25	by div. 102 3 55,0 1 57,50	117,399
T=60·43 B=30·220	680	Neg.	109·72 90·90 109·10 91·50	100·310 100·000 100·300	100·155 100·150	100·152	at div. 100 11 20 4 22 0 23 59	at div. 102 11 19 56 22 9 23 51	by div. 100 3 55,0 1 57,5	by div. 102 3 55,0 1 57,5	117,500

14th Series.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

May 13 T=60·85 B=30·380	681	Pos.	100·00 101·54 100·15 101·36	100·770 100·845 100·755	100·807 100·800	100·803	The arc too	small for	observing	the time.	
	682	Neg.	101·36 96·80 100·98 97·08	99·080 98·890 99·030	98·985 98·960	98·972	at div. 98 10 3 22 5 9 8 30	at div. 99 10 3 0 5 32 8 4	by div. 98 5 8,0 2 34,0	by div. 99 5 4,0 2 32,0	152,056
Continued.	683	Pos.	97·08 104·00 97·80 103·46	100·540 100·900 100·630	100·720 100·765	100·742	at div. 100 10 10 37 13 32 15 39	at div. 101 10 10 51 13 16 15 57	by div. 100 5 2,0 2 31,0	by div. 101 5 6,0 2 33,0	152,484

14th Series continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	684	Neg.	103·46 94·90 102·54 95·50	99·180 98·720 99·020	98·950 98·870	98·910	at div. 98 10 18 44 20 53 23 51	at div. 99 10 18 32,5 21 6 23 37	by div. 98 5 7,0 2 33,50	by div. 99 5 4,5 2 32,25	152,363
	685	Pos.	95·50 105·30 96·40 104·48	100·400 100·850 100·440	100·625 100·645	100·635	at div. 100 10 26 10,5 28 58 31 15	at div. 101 10 26 21 28 47 31 27	by div. 100 5 4,5 2 32,25	by div. 101 5 6,0 2 33,00	152,725
	686	Neg.	104·48 93·64 103·30 94·40	99·060 98·470 98·850	98·765 98·660	98·712	at div. 98 10 34 10 36 27 39 15	at div. 99 10 34 0,5 36 37,5 39 4	by div. 98 5 5,0 2 32,50	by div. 99 5 3,5 2 31,75	151,965
	687	Pos.	94·40 105·80 95·46 104·80	100·100 100·630 100·130	100·365 100·380	100·372	at div. 100 10 41 43 missed. 46 48,5	at div. 101 10 41 51 missed. 46 59	by div. 100 5 5,5 2 32,75	by div. 101 5 8,0 2 34,00	153,215
T = 60·85 B = 30·380	688	Neg.	104·80 92·70 103·52 93·48	98·750 98·110 98·500	98·430 98·305	98·367	at div. 98 10 49 35 52 0,5 54 40,5	at div. 99 10 49 27 52 9 54 30,5	by div. 98 5 5,5 2 32,75	by div. 99 5 3,5 2 31,75	152,383
May 14 T = 60·65 B = 30·424	689	Pos.	94·60 104·70 95·84 104·00	99·650 100·270 99·920	99·960 100·095	100·027	at div. 100 6 22 9 24 43 26 12	at div. 101 6 22 19 24 32 26 24	by div. 100 5 3.0 2 31,5	by div. 101 5 5,0 2 32,5	151,527
	690	Neg.	104·00 93·32 103·10 94·50	98·660 98·210 98·800	98·435 98·505	98·470	at div. 98 6 29 54 missed. 35 0	at div. 99 6 29 45 missed. 34 49	by div. 98 5 6,0 2 33,0	by div. 99 5 4,0 2 32,0	152,530
	691	Pos.	94·50 105·74 95·70 104·92	100·120 100·720 100·310	100·420 100·515	100·467	at div. 100 6 37 29 40 11 42 31	at div. 101 6 37 38 40 1 42 42	by div. 100 5 2,0 3 31,0	by div. 101 5 4,0 3 32,0	151,467
	692	Neg.	104·92 93·32 103·70 94·30	99·120 98·510 99·000	98·815 98·755	98·785	at div. 98 6 45 22 missed. 50 28	at div. 99 6 45 13,5 missed. 50 17,5	by div. 98 5 6,0 3 33,0	by div. 99 5 4,0 3 32,0	152,215
	693	Pos.	94·30 106·16 95·58 105·22	100·230 100·870 100·400	100·550 100·635	100·592	at div. 100 6 52 52 55 35,5 57 55	at div. 101 6 53 0,5 55 26 58 5	by div. 100 5 3,0 2 31,50	by div. 101 5 4,5 2 32,25	151,944
	694	Neg.	105·22 93·20 103·92 94·12	99·210 98·560 99·020	98·885 98·790	98·837	at div. 98 7 0 46,5 3 3 5 51	at div. 99 7 0 38 3 12,5 5 41	by div. 98 5 4,5 3 32,25	by div. 99 5 3,0 3 31,50	151,622
Continued.	695	Pos.	94·12 106·32 95·38 105·30	100·220 100·850 100·340	100·535 100·595	100·565	at div. 100 7 8 15 10 57 13 18	at div. 101 7 8 23 10 48,5 13 28	by div. 100 5 3,0 2 31,5	by div. 101 5 5,0 2 32,5	152,065

14th SERIES continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	696	Neg.	103·30 92·90 104·00 93·90	99·100 98·450 98·930	98·775 98·700	98·737	at div. 98 7 16 6 18 26 21 11	at div. 99 7 15 58 18 35 21 1	by div. 98 5 5,0 2 32,5	by div. 99 5 3,0 2 31,3	s 151,763
	697	Pos.	93·90 106·38 95·15 103·34	100·140 100·765 100·245	100·452 100·305	100·478	at div. 100 7 23 36,5 26 17 28 40	at div. 101 7 23 44,5 26 8,5 28 30	by div. 100 5 3,5 2 31,73	by div. 101 5 5,5 2 32,73	152,228
	698	Neg.	105·34 92·70 104·02 93·74	99·020 98·360 98·880	98·690 98·620	98·653	at div. 98 7 31 27,5 33 48 36 32,3	at div. 99 7 31 19,5 33 36,5 36 23	by div. 98 5 3,0 2 32,50	by div. 99 5 3,5 2 31,73	152,009
	699	Pos.	93·74 106·38 95·00 103·30	100·060 100·690 100·150	100·373 100·420	100·397	at div. 100 7 39 0 41 40 44 4	at div. 101 7 39 8 41 31 44 13,3	by div. 100 5 4,0 2 32,00	by div. 101 5 5,3 2 32,75	152,298
	700	Neg.	103·30 92·60 103·92 93·68	98·950 98·260 98·800	98·605 98·330	98·367	at div. 98 7 46 50 49 13 31 55,5	at div. 99 7 46 42 49 22 51 46	by div. 98 5 3,5 2 32,73	by div. 99 3 4,0 2 32,00	152,323
	701	Pos.	93·68 106·34 93·00 105·30	100·010 100·670 100·130	100·340 100·410	100·375	at div. 100 7 54 23,5 missed. 59 27,5	at div. 101 7 54 31 missed. 39 37	by div. 100 3 4,0 2 32,0	by div. 101 5 6,0 2 33,0	152,373
T = 60·45 B = 30·430	702	Neg.	103·30 92·60 104·00 93·60	98·950 98·300 98·800	98·625 98·530	98·387	at div. 98 8 2 13 4 35 7 18,3	at div. 99 8 2 5 4 43 7 9	by div. 98 5 5,5 2 32,75	by div. 99 3 4,0 2 32,00	132,310
May 14 T = 60·43 B = 30·430	703	Pos.	89·30 110·06 91·00 108·38	99·680 100·330 99·690	100·105 100·110	100·107	at div. 100 10 48 39 51 14 53 46,5	at div. 101 10 48 44 51 9 33 52	by div. 100 5 7,5 2 33,75	by div. 101 5 8,0 2 34,00	153,777
	704	Neg.	108·38 88·80 106·60 90·20	98·390 97·700 98·400	98·145 98·030	98·097	at div. 98 10 36 24,5 38 57 11 1 32	at div. 99 10 36 19,5 59 2 11 1 26	by div. 98 5 7,5 2 33,75	by div. 99 5 6,5 2 33,25	133,702
	705	Pos.	90·20 108·70 91·72 107·40	99·430 100·210 99·560	99·830 99·885	99·857	at div. 99 11 4 3 6 47,5 9 10	at div. 100 11 4 8,5 6 41 9 16,5	by div. 99 5 7,0 2 33,5	by div. 100 5 8,0 2 34,0	153,928
	706	Neg.	107·40 89·50 106·00 90·72	98·450 97·750 98·360	98·100 98·055	98·077	at div. 98 11 11 33,5 14 26 17 1,5	at div. 99 11 11 48 14 32,5 16 33	by div. 98 5 8,0 2 34,0	by div. 99 5 7,0 2 33,5	153,962
Continued.	707	Pos.	90·72 108·30 92·28 107·20	99·510 100·290 99·740	99·900 100·015	99·957	at div. 99 11 19 33,5 22 19,5 24 40,5	at div. 100 11 19 39 22 13,5 24 47	by div. 99 5 7,0 2 33,5	by div. 100 5 8,0 2 34,0	133,978

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	708	Neg.	107·20 89·90 105·92 91·08	98·550 97·910 98·500	98·230 98·205	98·217	at div. 98 11 27 25 29 56,5 32 34	at div. 99 11 27 19 30 3,5 32 27,5	by div. 98 5 9,0 2 34,50	by div. 99 5 8,5 2 34,25	154,446
	709	Pos.	91·08 108·34 92·42 107·30	99·710 100·380 99·860	100·045 100·120	100·082	at div. 100 11 35 9,5 37 45,5 40 17,5	at div. 101 11 35 15 37 39,5 40 24	by div. 100 5 8,0 2 34,0	by div. 101 5 9,0 2 34,5	154,041
T = 60·47 B = 30·400	710	Neg.	107·30 90·00 106·06 91·08	98·650 98·030 98·570	98·340 98·300	98·320	at div. 98 11 42 58 45 28,5 48 7	at div. 99 11 42 52 45 35 48 0	by div. 98 5 9.0 2 34,5	by div. 99 5 8,0 2 34.0	154,340
May 15 T = 59·87 B = 30·230	711	Pos.	95·14 101·74 95·76 101·10	98·440 98·750 98·430	98·595 98·590	98·592	at div. 98 9 43 48 missed. 48 53	at div. 99 9 44 3,5 missed. 49 12	by div. 98 5 5,0 2 32,50	by div. 99 5 8,5 2 34,25	153,536
	712	Neg.	101·10 92·60 100·10 93·30	96·850 96·350 96·700	96·600 96·525	96·562	at div. 96 9 51 52 54 12 57 0	at div. 97 9 51 40 54 25 56 45	by div. 96 5 8,0 2 34,0	by div. 97 5 5,0 2 32,5	153,157
	713	Pos.	93·30 102·92 94·32 102·28	98·110 98·620 98·300	98·365 98·460	98·412	at div. 98 9 59 27,5 missed. 10 4 32,5	at div. 99 9 59 38 missed. 10 4 45	by div. 98 5 5,0 2 32,5	by div. 99 5 7,0 2 33,5	152,912
	714	Neg.	102·28 91·52 101·42 92·60	96·900 96·470 97·010	96·685 96·740	96·712	at div. 96 10 7 24 missed. 12 34	at div. 97 10 7 15 missed. 12 23	by div. 96 5 10,0 2 35,0	by div. 97 5 8,0 2 34,0	154,288
	715	Pos.	92·60 104·18 93·98 103·36	98·390 99·080 98·670	98·735 98·875	98·805	at div. 98 10 15 0 17 49 20 6	at div. 99 10 15 9 17 39 20 16,5	by div. 98 5 6,0 2 33,00	by div. 99 5 7,5 2 33,75	153,604
	716	Neg.	103·36 91·14 102·32 92·32	97·250 96·730 97·320	96·990 97·025	97·007	at div. 97 10 22 54 25 27 28 3	at div. 98 10 22 46 25 36 27 53,5	by div. 97 5 9,0 2 34,50	by div. 98 5 7.5 2 33,75	154,496
	717	Pos.	92·32 105·00 93·58 104·14	98·660 99·290 98·860	98·975 99·075	99·025	at div. 99 10 30 40 33 15,5 35 48	at div. 100 10 30 48 33 7 35 57,5	by div. 99 5 8,0 2 34,00	by div. 100 5 9,5 2 34,75	154,019
	718	Neg.	104·14 90·96 102·94 91·92	97·550 96·950 97·430	97·250 97·190	97·220	at div. 97 10 38 30 41 0,5 43 38,5	at div. 98 10 38 22,5 41 8 43 29,5	by div. 97 5 8,5 2 34,25	by div. 98 5 7,0 2 33,50	154,085
Continued.	719	Pos.	91·92 105·52 93·14 104·64	98·720 99·330 98·890	99·025 99·110	99·067	at div. 99 10 46 15 48 52 51 23,5	at div. 100 10 46 22,5 48 44 51 32,5	by div. 99 5 8,5 2 34,25	by div. 100 5 10,0 2 35,00	154,300

14th SERIES continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	720	Neg.	104·64 90·50 103·50 91·50	97·570 97·000 97·500	97·285 97·250	97·267	at div. 97 10 54 6 56 36 59 16	at div. 98 10 53 59 56 44 59 7,5	by div. 97 5 10,0 2 35,00	by div. 98 5 8,5 2 34,25	154,800
	721	Pos.	91·50 106·18 92·78 105·30	98·840 99·480 99·040	99·160 99·260	99·210	at div. 99 11 1 49,5 4 27,5 6 58	at div. 100 11 1 56 4 20 7 6	by div. 99 5 8,5 2 34,25	by div. 100 5 10,0 2 35,00	154,407
	722	Neg.	105·30 90·20 104·14 91·12	97·750 97·170 97·630	97·460 97·400	97·430	at div. 97 11 9 41 12 10 14 51	at div. 98 11 9 35 12 17 14 44	by div. 97 5 10,0 2 35,0	by div. 98 5 9,0 2 34,5	154,785
	723	Pos.	91·12 106·70 92·38 105·66	98·910 99·540 99·020	99·225 99·280	99·252	at div. 99 11 17 25 20 4,5 22 35	at div. 100 11 17 32 19 58 22 42,5	by div. 99 5 10,0 2 35.00	by div. 100 5 10,5 2 35,25	155,063
	724	Neg.	105·66 89·80 104·20 90·62	97·730 97·000 97·410	97·365 97·205	97·285	at div. 97 11 25 18,5 27 51 30 28,5	at div. 98 11 25 12,5 27 57 30 21,5	by div. 97 5 10,0 2 35,0	by div. 98 5 9.0 2 34,5	154,858
	725	Pos.	90·62 106·90 91·88 105·82	98·760 99·390 98·850	99·075 99·120	99·097	at div. 99 11 33 5 missed. 38 16	at div. 100 11 33 11 missed. 38 23	by div. 99 5 11,0 2 35,5	by div. 100 5 12,0 2 36,0	155,548
T = 60·31 B = 30·204	726	Neg.	105·82 89·30 104·54 90·40	97·560 96·920 97·470	97·240 97·195	97·217	at div. 97 11 40 58 43 31 46 10	at div. 98 11 40 52 43 37 46 3	by div. 97 5 12,0 2 36,0	by div. 98 5 11,0 3 35,5	155,892

15th SERIES.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

May 31 T = 68·37 B = 30·070	727	Pos.	96·50 108·12 97·72 107·20	102·310 102·920 102·460	102·615 102·690	102·652	at div. 102 5 26 6 missed. 31 12	at div. 103 5 26 14,5 missed. 31 23	by div. 102 5 6,0 2 33,00	by div. 103 5 8.5 2 34,25	153,815
	728	Neg.	107·20 95·12 106·00 96·50	101·160 100·560 101·250	100·860 100·905	100·882	at div. 100 5 34 5 36 23,5 39 14	at div. 101 5 33 56,5 36 32,5 39 4	by div. 100 5 9,0 2 34,50	by div. 101 5 7.5 2 33.75	153,839
	729	Pos.	96·50 108·40 97·70 107·50	102·450 103·050 102·600	102·750 102·825	102·787	at div. 102 5 41 41 44 29 46 46	at div. 103 5 41 49,5 44 20 46 56	by div. 102 5 5,0 2 32,50	by div. 103 5 6,5 2 33,25	153,090
Continued.	730	Neg.	107·50 95·18 106·30 96·22	101·340 100·740 101·260	101·040 101·000	101·020	at div. 101 5 49 32 missed. 54 39,5	at div. 102 5 49 23 missed. 54 29	by div. 101 5 7,5 2 33,75	by div. 102 5 6,0 2 33,00	153,735

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N .		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	731	Pos.	96·22 108·92 97·68 107·90	102·570 103·300 102·790	102·935 103·045	102·990	at div. 102 5 57 8,5 59 59 6 2 13	at div. 103 5 57 16,5 59 50 6 2 23	by div. 102 5 4,5 2 32,25	by div. 103 5 6,5 2 33,25	* 153,242
	732	Neg.	107·90 95·20 106·50 96·30	101·550 100·850 101·400	101·200 101·125	101·162	at div. 101 6 5 3 7 34 10 10,5	at div. 102 6 4 55,5 7 43 10 1	by div. 101 5 7,5 2 33,75	by div. 102 5 5,5 2 32,75	153,588
	733	Pos.	96·30 109·06 97·64 108·00	102·680 103·350 102·820	103·015 103·085	103·050	at div. 103 6 12 46,5 15 21 17 53	at div. 104 6 12 54,5 15 13 18 3	by div. 103 5 6,5 2 33,25	by div. 104 5 8,5 2 34,25	153,300
	734	Neg.	108·00 95·14 106·52 96·20	101·570 100·830 101·360	101·200 101·095	101·147	at div. 101 6 20 33 23 4 25 40,5	at div. 102 6 20 25 23 13 25 31	by div. 101 5 7,5 2 33,75	by div. 102 5 6,0 2 33,00	153,640
	735	Pos.	96·20 109·00 97·60 107·90	102·600 103·300 102·750	102·950 103·025	102·987	at div. 102 6 28 10 31 0 33 15,5	at div. 103 6 28 17,5 30 51 33 25	by div. 102 5 5,5 2 32,75	by div. 103 5 7,5 2 33,75	153,737
	736	Neg.	107·90 95·12 106·42 96·22	101·510 100·770 101·320	101·140 101·045	101·092	at div. 101 6 36 4 38 36 41 11,5	at div. 102 6 35 56,5 38 45 41 2	by div. 101 5 7,5 2 33,75	by div. 102 5 5,5 2 32,75	153,658
	737	Pos.	96·22 108·90 97·55 107·80	102·560 103·225 102·675	102·892 102·950	102·921	at div. 102 6 43 42 46 31,5 48 47,5	at div. 103 6 43 50 46 23 48 57	by div. 102 5 5,5 2 32,75	by div. 103 5 7,0 2 33,50	153,441
	738	Neg.	107·80 95·10 106·40 96·16	101·450 100·750 101·280	101·100 101·015	101·057	at div. 101 6 51 36 54 9 56 43	at div. 102 0 51 28,5 54 18 56 33,5	by div. 101 5 7,0 2 33,5	by div. 102 5 5,0 2 32,5	153,443
	739	Pos.	96·16 108·80 97·52 107·70	102·480 103·160 102·610	102·820 102·885	102·852	at div. 102 6 59 15 7 1 53,5 4 20	at div. 103 6 59 22,5 7 1 44,5 4 29,5	by div. 102 5 5,0 2 32,5	by div. 103 5 7,0 2 33,5	153,352
	740	Neg.	107·70 95·12 106·36 96·20	101·410 100·740 101·280	101·075 101·010	101·042	at div. 101 7 7 8 9 40 12 15	at div. 102 7 7 0 9 49 12 5,5	by div. 101 5 7,0 2 33,50	by div. 102 5 5,5 2 32,75	153,469
	741	Pos.	96·20 108·88 97·50 107·50	102·540 103·190 102·500	102·865 102·845	102·855	at div. 102 7 14 46 17 34 19 51	at div. 103 7 14 53,5 17 36 20 0,5	by div. 102 5 5,0 2 32,5	by div. 103 5 7,0 2 33,5	153,355
Continued.	742	Neg.	107·50 95·14 106·32 96·20	101·320 100·730 101·260	101·025 100·995	101·010	at div. 101 7 22 40 25 12,5 27 46,5	at div. 102 7 22 32 25 22 27 37	by div. 101 5 6,5 2 33,25	by div. 102 5 5,0 2 32,50	153,240

15th Series continued.—2-inch *Ivory* balls, with bifilar *iron*-wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	743	Pos.	96·20 108·80 97·58 107·70	102·500 103·190 102·640	102·845 102·915	102·880	at div. 102 7 30 17,5 missed. 35 22	at div. 103 7 30 25,5 missed. 35 32	by div. 102 5 4.5 2 32,25	by div. 103 5 6,5 2 33,25	153,130
	744	Neg.	107·70 95·20 106·40 96·30	101·450 100·800 101·350	101·125 101·075	101·100	at div. 101 7 38 11 40 43 43 17	at div. 102 7 38 3 40 52 43 7,5	by div. 101 5 6,0 2 33,00	by div. 102 5 4,5 2 32,25	152,925
	745	Pos.	96·30 108·90 97·70 107·92	102·600 103·300 102·810	102·950 103·055	103·002	at div. 103 7 45 55 48 28 51 0,5	at div. 104 7 46 3 48 20 51 10	by div. 103 5 5,5 2 32,75	by div. 104 5 7,0 2 33.50	152,751
	746	Neg.	107·92 95·00 106·30 96·26	101·460 100·650 101·280	101·055 100·965	101·010	at div. 101 7 53 42 56 12,5 58 46	at div. 102 7 53 34 56 21,5 58 36	by div. 101 5 4,0 2 32,0	by div. 102 5 2,0 2 31,0	151,990
	747	Pos.	96·26 108·90 97·68 107·90	102·580 103·290 102·790	102·935 103·040	102·987	at div. 102 8 1 16 4 6,5 6 20	at div. 103 8 2 24 3 58 6 29,5	by div. 102 5 4,0 2 32,00	by div. 103 5 5,5 2 32,75	152,740
T=68·91 B=30·080	748	Neg.	107·90 95·30 106·22 96·54	101·600 100·760 101·380	101·180 101·070	101·125	at div. 101 8 9 15 11 44 14 20	at div. 102 8 9 6,5 11 53 14 10	by div. 101 5 5,0 2 32,50	by div. 102 5 3,5 2 31,75	152,406
June 1 T=68·83 B=30·216	749	Pos.	94·80 108·92 96·20 107·80	101·860 102·560 102·000	102·210 102·280	102·245	at div. 102 9 58 59 missed. 10 4 7,5	at div. 103 9 59 6 missed. 10 4 16	by div. 102 5 8,5 2 34,25	by div. 103 5 10,0 2 35,00	154,434
	750	Neg.	107·80 93·60 106·42 94·68	100·700 100·010 100·550	100·355 100·280	100·317	at div. 100 10 6 51 9 20 12 0,5	at div. 101 10 6 44 9 28 11 52	by div. 100 5 9,5 2 34,75	by div. 101 5 8,0 2 34,00	154,512
	751	Pos.	94·68 109·00 96·12 107·98	101·840 102·560 102·050	102·200 102·305	102·252	at div. 102 10 14 34,5 17 13 19 42,5	at div. 103 10 14 41,5 17 5,5 19 51	by div. 102 5 8,0 2 34,00	by div. 103 5 9,5 2 34,75	154,189
	752	Neg.	107·98 93·66 106·60 94·80	100·820 100·130 100·700	100·475 100·415	100·445	at div. 100 10 22 28 24 56 27 38	at div. 101 10 22 21 25 4 27 30	by div. 100 5 10,0 2 35,0	by div. 101 5 9,0 2 34.5	154,778
	753	Pos.	94·80 109·20 96·20 108·20	102·000 102·700 102·200	102·350 102·450	102·400	at div. 102 10 30 10,5 32 51,5 35 19	at div. 103 10 30 17,5 32 43,5 35 27	by div. 102 5 8,5 2 34,25	by div. 103 5 9.5 2 34,75	154,450
Continued.	754	Neg.	108·20 93·65 106·92 94·88	100·925 100·285 100·900	100·605 100·592	100·598	at div. 100 10 38 6 40 32 43 17	at div. 101 10 37 59 40 39,5 43 8,5	by div. 100 5 11,0 2 35,50	by div. 101 5 9,5 2 34,75	155,052

15th SERIES continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	755	Pos.	94·88 109·50 96·30 108·48	102·190 102·900 102·390	102·545 102·645	102·595	at div. 102 10 45 47 48 30,5 50 55	at div. 103 10 45 54 48 23 51 3,5	by div. 102 5 8,0 2 34,00	by div. 103 5 9,5 2 34,75	s 154,446
	756	Neg.	108·48 93·86 107·20 94·94	101·170 100·530 101·070	100·850 100·800	100·825	at div. 100 10 53 45,5 56 9 58 57	at div. 101 10 53 38,5 56 16 58 48,5	by div. 100 5 11,5 2 35,75	by div. 101 5 10,0 2 35,00	155,131
	757	Pos.	94·94 109·68 96·30 108·62	102·310 102·990 102·460	102·650 102·725	102·687	at div. 102 11 1 25 4 10,5 6 34	at div. 103 11 1 32 4 3 6 42	by div. 102 5 9,0 2 34,5	by div. 103 5 10,0 2 35,0	154,843
	758	Neg.	108·62 93·70 107·30 94·84	101·160 100·500 101·070	100·830 100·785	100·807	at div. 100 11 9 25 11 48 14 36,5	at div. 101 11 9 18,5 11 56 14 28,5	by div. 100 5 11,5 2 35,75	by div. 101 5 10,0 2 35,00	155,145
	759	Pos.	94·84 109·90 96·14 108·72	102·370 103·020 102·430	102·695 102·725	102·710	at div. 102 11 17 4,5 19 49 22 14	at div. 103 11 17 11 19 42 22 22	by div. 102 5 9,5 2 34,75	by div. 103 5 11,0 2 35,50	155,282
	760	Neg.	108·72 93·60 107·42 94·72	101·160 100·510 101·070	100·835 100·790	100·812	at div. 100 11 25 5 27 28 30 17	at div. 101 11 25 58 27 35,5 30 9	by div. 100 5 12,0 2 36,0	by div. 101 5 11,0 2 35,5	155,594
	761	Pos.	94·72 110·00 96·08 108·92	102·360 103·040 102·500	102·700 102·770	102·735	at div. 102 11 32 44 35 30,5 37 54	at div. 103 11 32 51 35 23 38 2	by div. 102 5 10,0 2 35,0	by div. 103 5 11,0 2 35,5	155,367
T=68·95 B=30·230	762	Neg.	108·92 93·52 107·60 94·68	101·220 100·560 101·140	100·890 100·850	100·870	at div. 100 11 40 45,5 43 8,5 45 57,5	at div. 101 11 40 39 43 15,5 45 50	by div. 100 5 12,0 2 36,0	by div. 101 5 11,0 2 35,5	155,565
June 2 T=67·53 B=30·262	763	Pos.	99·80 108·70 100·64 107·90	104·250 104·670 104·270	104·460 104·470	104·465	at div. 104 10 23 27,5 26 14 28 35	at div. 105 10 23 39,5 26 1,5 28 48,5	by div. 104 5 7,5 2 33,75	by div. 105 5 9,0 2 34,50	154,099
	764	Neg.	107·90 97·60 106·70 98·26	102·750 102·150 102·480	102·450 102·315	102·382	at div. 102 10 31 24 33 49 36 31	at div. 103 10 31 14,5 34 0 36 19	by div. 102 5 7,0 2 33,50	by div. 103 5 4,5 2 32,25	153,023
	765	Pos.	98·26 109·42 99·32 108·40	103·840 104·370 103·860	104·105 104·115	104·110	at div. 104 10 39 6 41 43 44 14,5	at div. 105 10 39 15 41 33 44 25,5	by div. 104 5 8,5 2 34,25	by div. 105 5 10,5 2 35,25	154,360
Continued.	766	Neg.	108·40 96·48 107·20 97·34	102·440 101·840 102·270	102·140 102·055	102·097	at div. 102 10 46 55 49 27 52 3	at div. 103 10 46 47 49 36 51 53	by div. 102 5 8,0 2 34,0	by div. 103 5 6,0 2 33,0	153,903

15th Series continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	767	Pos.	97·34 109·82 98·42 108·80	103·580 104·120 103·610	103·850 103·865	103·857	at div. 103 10 54 33 57 22 59 39,5	at div. 104 10 54 41 57 13 59 49	by div. 103 5 6,5 2 33,25	by div. 104 5 8,0 2 34,00	153,893
	768	Neg.	108·80 95·70 107·54 96·68	102·250 101·620 102·110	101·935 101·865	101·900	at div. 101 11 2 34 4 53 7 43	at div. 102 11 2 26 5 1 7 33,5	by div. 101 5 9,0 2 34,50	by div. 102 5 7,5 2 33,75	153,825
	769	Pos.	96·68 110·12 97·90 109·20	103·400 104·010 103·550	103·705 103·780	103·742	at div. 103 11 10 8 12 53 15 15	at div. 104 11 10 15,5 12 44 15 23,5	by div. 103 5 7,0 2 33,5	by div. 104 5 8,0 2 34,0	153,871
	770	Neg.	109·20 95·26 108·02 96·26	102·230 101·640 102·140	101·935 101·890	101·912	at div. 101 11 18 5 20 25 23 14	at div. 102 11 17 58 20 33 23 6	by div. 101 5 9,0 2 34,5	by div. 102 5 8,0 2 34,0	154,044
	771	Pos.	96·26 110·52 97·50 109·52	103·390 104·010 103·510	103·700 103·760	103·730	at div. 103 11 25 39 28 24 30 45	at div. 104 11 25 46 28 16 30 53,5	by div. 103 5 6,0 2 33,00	by div. 104 5 7,5 2 33,75	153,547
T=67·85 B=30·262	772	Neg.	100·52 95·00 108·30 96·02	102·260 101·650 102·160	101·955 101·905	101·930	at div. 101 11 33 35 35 55,5 38 44	at div. 102 11 33 28 36 3 38 36	by div. 101 5 9,0 2 34,5	by div. 102 5 8,0 2 34,0	154,035

16th Series.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

June 3 T=68·11 B=30·250	773	Pos.	93·42 110·62 94·56 109·70	102·020 102·590 102·130	102·305 102·360	102·332	at div. 102 10 9 46,5 12 46 15 35,5	at div. 103 10 9 53 12 39 15 43	by div. 102 5 49,0 2 54,5	by div. 103 5 50,0 2 55,0	174,666
	774	Neg.	109·70 90·70 108·50 91·70	100·200 99·600 100·100	99·900 99·850	99·875	at div. 99 10 18 42 21 26 24 32	at div. 100 10 18 36 21 32 24 25	by div. 99 5 50,0 2 55,0	by div. 100 5 49,0 2 54,5	174,563
	775	Pos.	91·70 112·14 93·00 111·10	101·920 102·570 102·050	102·245 102·310	102·277	at div. 102 10 27 23 30 21 33 12	at div. 104 10 27 34 30 8,5 33 24,5	by div. 102 5 49,0 2 54,50	by div. 104 5 50,5 2 55,25	174,604
	776	Neg.	111·10 89·30 109·76 90·40	100·200 99·530 100·080	99·865 99·805	99·835	at div. 98 10 36 22 38 57 42 12	at div. 100 10 36 11 39 8 42 0	by div. 98 5 50,0 2 55,0	by div. 100 5 49,0 2 54,5	174,541
Continued.	777	Pos.	90·40 113·32 91·70 112·10	101·860 102·510 101·900	102·185 102·205	102·195	at div. 102 10 44 58,5 47 55 50 48	at div. 104 10 45 8,5 47 44 50 59	by div. 102 5 49,5 2 54,75	by div. 104 5 50,5 2 55,25	174,799

16th SERIES continued.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	778	Neg.	112·10 88·14 110·70 89·10	100·120 99·420 99·900	99·770 99·660	99·715	at div. 98 10 53 56,5 56 34 59 46,5	at div. 100 10 53 47 56 44 59 36	by div. 98 5 50,0 2 55,0	by div. 100 5 49,0 2 54,5	174,571
	779	Pos.	89·10 114·18 90·70 112·92	101·640 102·440 101·810	102·040 102·125	102·082	at div. 102 11 2 35,5 5 32 8 25	at div. 104 11 2 44,5 5 22,5 8 35	by div. 102 5 49,5 2 54,75	by div. 104 5 50,5 2 55,25	174,770
T = 68·37 B = 30·240	780	Neg.	112·92 87·18 111·48 88·40	100·050 99·330 99·940	99·690 99·635	99·662	at div. 98 11 11 32 14 31 17 23	at div. 100 11 11 23 14 41 17 13	by div. 98 5 51,0 2 55,5	by div. 100 5 50,0 2 55,0	175,085
June 4 T = 66·45 B = 30·384	781	Pos.	97·00 110·02 97·80 109·00	103·510 103·910 103·400	103·710 103·655	103·682	at div. 103 2 50 51 missed. 56 50	at div. 104 2 51 0 missed. 57 0	by div. 103 5 59,0 2 59,5	by div. 104 6 0,0 3 c,0	179,841
	782	Neg.	109·00 93·38 107·66 94·10	101·190 100·520 100·880	100·855 100·700	100·777	at div. 100 3 0 6,5 2 52 6 3	at div. 101 2 59 59 3 3 0 5 54,5	by div. 100 5 56,5 2 58,25	by div. 101 5 55,5 2 57,75	177,862
	783	Pos.	94·10 111·48 95·10 110·20	102·790 103·290 102·650	103·040 102·970	103·005	at div. 102 3 8 53,5 12 7 14 51,5	at div. 104 3 9 7 11 53 15 7	by div. 102 5 58,0 2 59,0	by div. 104 6 0,0 3 0,0	179,502
	784	Neg.	110·20 91·02 108·60 92·00	100·610 99·810 100·300	100·210 100·055	100·132	at div. 100 3 18 3,5 20 59 24 0	at div. 102 3 17 51,5 21 13 23 46	by div. 100 5 56,5 2 58,25	by div. 102 5 54,5 2 57,25	178,184
	785	Pos.	92·00 112·20 93·32 110·80	102·100 102·760 102·060	102·430 102·410	102·420	at div. 102 3 26 59,5 30 4 32 57,5	at div. 104 3 27 11 29 52 33 11	by div. 102 5 58,0 2 59,0	by div. 104 6 0,0 3 0,0	179,210
	786	Neg.	110·80 89·50 109·12 90·70	100·150 99·310 99·910	99·730 99·610	99·670	at div. 98 3 36 12 38 52 42 10	at div. 100 3 36 1 39 3 41 57,5	by div. 98 5 58,0 2 59,00	by div. 100 5 56,5 2 58,25	178,374
	787	Pos.	90·70 112·58 92·20 111·08	101·640 102·390 101·640	102·015 102·015	102·015	at div. 102 3 45 2,5 48 2 51 1	at div. 104 3 45 13 47 51 51 13	by div. 102 5 58,5 2 59,25	by div. 104 6 0,0 3 0,00	179,255
	788	Neg.	111·08 88·52 109·32 89·90	99·800 98·920 99·610	99·360 99·265	99·312	at div. 98 3 54 10 56 54,5 4 0 8	at div. 100 3 54 0 57 5,5 59 56	by div 98 5 58,0 2 59,0	by div. 100 5 56,0 2 58,0	178,344
Continued.	789	Pos.	89·90 112·74 91·52 111·18	101·320 102·130 101·350	101·725 101·740	101·732	at div. 100 4 2 54 6 11 8 51	at div. 102 4 3 4 6 0,5 9 2,5	by div. 100 5 57,0 2 58,50	by div. 102 5 58,5 2 59,25	179,149

16th SERIES continued.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Cootinued.	790	Neg.	111·18 87·88 109·48 89·50	99·530 98·680 99·490	99·105 99·085	99·095	at div. 98 4 12 8 14 56 18 7	at div. 100 4 11 58,5 15 7 17 56	by div. 98 5 59,0 2 59,50	by div. 100 5 57,5 2 58,75	* 179,090
	791	Pos.	89·50 112·80 91·12 111·22	101·150 101·960 101·170	101·555 101·565	101·560	at div. 100 4 20 55 24 10,5 26 52	at div. 102 4 21 5 24 0 27 3,5	by div. 100 5 57,0 2 58,50	by div. 102 5 58,5 2 59,25	179,085
	792	Neg.	111·22 87·74 109·38 89·28	99·480 98·560 99·330	99·020 98·945	98·982	at div. 98 4 30 9 32 58 56 7,5	at div. 100 4 29 59 55 8,5 55 56	by div. 98 5 58,5 2 59,25	by div. 100 5 57,0 2 58,50	178,882
	795	Pos.	89·28 112·62 91·10 111·08	100·950 101·860 101·090	101·405 101·475	101·440	at div. 100 4 58 58 42 12 44 54,5	at div. 102 4 59 8 42 1,5 45 6	by div. 100 5 56,5 2 58,25	by div. 102 5 58,0 2 59,00	178,790
T=67·05 B=30·370	794	Neg.	111·08 87·70 109·28 89·28	99·590 98·490 99·280	98·940 98·885	98·912	at div. 98 4 48 9 50 59 54 8	at div. 100 4 47 59,5 51 9,5 53 56	by div. 98 5 59,0 2 59,50	by div. 100 5 56,5 2 58,25	178,930
Joon 5 T=65·83 B=50·300	795	Pos.	95·82 108·50 96·80 107·22	102·060 102·550 102·010	102·305 102·280	102·292	at div. 102 6 15 8 missed. 20 46,5	at div. 103 6 15 17 missed. 20 57	by div. 102 5 38,5 2 49,25	by div. 103 5 40,0 2 50,00	169,469
	796	Neg.	107·22 92·60 105·74 93·46	99·910 99·170 99·600	99·540 99·585	99·462	at div. 99 6 24 5 26 50 29 52	at div. 100 6 25 57,5 26 59 29 43	by div. 99 5 47,0 2 53,50	by div. 100 5 45,5 2 52,75	173,154
	797	Pos.	95·46 109·40 94·70 108·30	101·430 102·050 101·500	101·740 101·775	101·757	at div. 100 6 32 35 55 56 38 22	at div. 102 6 32 49 55 40 38 38	by div. 100 5 47,0 2 53,5	by div. 102 5 49,0 2 54,5	174,378
	798	Neg.	108·30 91·00 106·70 92·10	99·650 98·850 99·400	99·250 99·125	99·187	at div. 98 6 41 44,5 44 21 47 53	at div. 100 6 41 31,5 44 56 47 17,5	by div. 98 5 48,5 2 54,25	by div. 100 5 46,0 2 53,00	173,508
	799	Pos.	92·10 110·20 93·58 109·00	101·150 101·890 101·290	101·520 101·590	101·555	at div. 100 6 50 14 55 28 56 0	at div. 102 6 50 26 55 15 56 14	by div. 100 5 46,0 2 55,0	by div. 102 5 48,0 2 54,0	173,777
	800	Neg.	109·00 90·10 107·38 91·30	99·550 98·740 99·340	99·145 99·040	99·092	at div. 98 6 59 17 7 1 57 5 6	at div. 100 6 59 5 7 2 10 4 52	by div. 98 5 49,0 2 54,5	by div. 100 5 47,0 2 53,5	173,954
Continued.	801	Pos.	91·30 110·80 92·90 109·50	101·050 101·850 101·200	101·450 101·525	101·487	at div. 100 7 7 48 11 1 13 34,5	at div. 102 7 7 59,5 10 48 13 48	by div. 100 5 46,5 2 53,25	by div. 102 5 48,5 2 54,25	173,995

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	802	Neg.	109·50 89·60 107·82 91·00	99·550 98·710 99·410	99·130 99·060	99·095	at div. 98 7 16 50 19 51 22 59	at div. 100 7 16 59 19 43 22 26	by div. 98 5 49,0 2 54,5	by div. 100 5 47,0 2 53,5	s 173,953
	803	Pos.	91·00 111·16 92·68 109·80	101·080 101·920 101·240	101·500 101·580	101·540	at div. 100 7 25 21,5 28 34,5 51 8	at div. 102 7 25 53 28 22 31 21,5	by div. 100 5 46,5 2 55,25	by div. 102 5 48,5 2 54,25	174,020
	804	Neg.	109·80 89·30 108·08 90·70	99·550 98·690 99·390	99·120 99·040	99·080	at div. 98 7 34 23 37 5 40 11,5	at div. 100 7 34 12 37 16,5 59 59	by div. 98 5 48,5 2 54,25	by div. 100 5 47,0 2 55,50	175,845
	805	Pos.	90·70 111·50 92·40 110·20	101·100 101·950 101·500	101·525 101·625	101·575	at div. 100 7 42 54 46 5,5 48 59	at div. 102 7 45 5 45 53,5 48 51,5	by div. 100 5 45,0 2 52,50	by div. 102 5 46,5 2 53,25	175,090
	806	Neg.	110·20 89·26 108·52 90·62	99·750 98·890 99·570	99·510 99·230	99·270	at div. 98 7 51 55 54 54 57 45	at div. 100 7 51 44 54 46 57 30,5	by div. 98 5 48,0 2 54,00	by div. 100 5 46,5 2 55,25	173,524
	807	Pos.	90·62 111·82 92·28 110·46	101·220 102·050 101·370	101·655 101·710	101·672	at div. 100 8 0 24 3 55 6 9,5	at div. 102 8 0 54,5 5 22 6 22	by div. 100 5 45,5 2 52,75	by div. 102 5 47,5 2 53,75	175,586
T = 65·63 B = 30·276	808	Neg.	110·46 88·92 108·80 90·50	99·690 99·860 99·550	99·275 99·205	99·240	at div. 98 8 9 24 12 4 15 11,5	at div. 100 8 9 13,5 12 15 14 59,5	by div. 98 5 47,5 2 55,75	by div. 100 5 46,0 2 55,00	173,285
June 6 T = 64·00 B = 30·044	809	Pos.	96·80 109·40 97·58 108·40	103·100 103·490 102·990	103·295 105·240	103·267	at div. 103 10 8 15 11 15 14 4	at div. 104 10 8 24 11 5,5 14 14,5	by div. 105 5 49,0 2 54,50	by div. 104 5 50,5 2 55,25	174,700
	810	Nag.	108·40 95·30 107·06 93·90	100·850 100·180 100·480	100·515 100·350	100·422	at div. 100 10 17 10 19 56,5 22 56,5	at div. 101 10 17 2,5 20 4 22 48	by div. 100 5 46,5 2 53,25	by div. 101 5 45,5 2 52,75	175,039
	811	Pos.	95·90 110·60 95·00 109·50	102·250 102·800 102·250	102·525 102·525	102·525	at div. 102 10 25 49,5 28 52 51 58	at div. 104 10 26 3 28 37 51 53,5	by div. 102 5 48,5 2 54,25	by div. 104 5 50,5 2 55,25	174,512
	812	Neg.	109·50 91·22 108·06 92·12	100·360 99·640 100·090	100·000 99·865	99·952	at div. 98 10 54 55,5 37 22,5 40 45	at div. 100 10 34 41 37 56 40 28,5	by div. 98 5 49,5 2 54,75	by div. 100 5 47,5 2 53,75	173,784
Continued.	813	Pos.	92·12 111·52 95·60 110·38	101·810 102·560 101·990	102·190 102·275	102·252	at div. 102 10 43 28,5 46 26 49 16,5	at div. 104 10 43 40 46 15 49 30	by div. 102 5 48,0 2 54,0	by div. 104 5 50,0 2 55,0	174,116

16th Series continued.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	814	Neg.	110·38 90·00 108·88 91·02	100·190 99·440 99·950	99·815 99·695	99·755	at div. 98 10 52 28 55 2 58 17	at div. 100 10 52 17 55 14 58 4,5	by div. 98 5 49,0 2 54,50	by div. 100 5 47,5 2 53,75	· 173,842
	815	Pos.	91·02 112·34 92·48 111·16	101·680 102·410 101·820	102·045 102·115	102·130	at div. 102 11 1 4 3 59 6 52	at div. 104 11 1 14,5 3 48 7 4	by div. 102 5 48,0 2 54,00	by div. 104 5 49,5 2 54,75	174,049
	816	Neg.	111·16 88·88 109·48 89·80	100·020 99·180 99·640	99·600 99·410	99·505	at div. 98 11 9 58 12 36 15 45	at div. 100 11 9 48 12 47 15 34	by div. 98 5 47,0 2 53,5	by div. 100 5 46,0 2 53,0	173,124
	817	Pos.	89·80 112·90 91·42 111·62	101·350 102·160 101·520	101·755 101·840	101·797	at div. 100 11 18 27 21 40,5 24 14	at div. 102 11 18 37 21 30 24 25	by div. 100 5 47,0 2 53,5	by div. 102 5 48,0 2 54,0	173,949
	818	Neg.	111·62 87·94 110·18 89·18	99·780 99·060 99·680	99·420 99·370	99·395	at div. 98 11 27 28,5 30 9 33 17,5	at div. 100 11 27 19 30 19 33 7	by div. 98 5 49,0 2 54,5	by div. 100 5 48,0 2 54,0	174,151
	819	Pos.	89·18 113·52 90·70 112·28	101·350 102·110 101·490	101·730 101·800	101·765	at div. 100 11 36 59,5 39 21 41 47	at div. 102 11 36 8,5 39 11 41 57	by div. 100 5 47,5 2 53,75	by div. 102 5 48,5 2 54,25	174,191
	820	Neg.	112·28 87·24 110·68 88·50	99·760 98·960 99·590	99·360 99·275	99·317	at div. 98 11 44 59 47 41 50 48,5	at div. 100 11 44 50,5 47 51 50 38,5	by div. 98 5 49,5 2 54,75	by div. 100 5 48,0 2 54,00	174,256
	821	Pos.	88·50 114·00 90·10 112·68	101·250 102·050 101·390	101·650 101·720	101·685	at div. 100 11 53 32,5 56 42 59 20	at div. 102 11 53 41 56 32,5 59 29,5	by div. 100 5 47,5 2 53,75	by div. 102 5 48,5 2 54,25	174,171
T = 64·17 B = 30·034	822	Neg.	112·68 86·68 111·00 88·00	99·680 98·840 99·500	99·260 99·170	99·215	at div. 98 0 2 31,5 5 14,5 8 20,5	at div. 100 0 2 23 5 24 8 11	by div. 98 5 49,0 2 54,5	by div. 100 5 48,0 2 54,0	174,196

17th Series.—2-inch *Lead* balls, with bifilar *iron* wire (shortened); distance = ·415 inch.

June 8 T = 57·60 B = 30·000	823	Pos.	96·48 110·92 96·92 110·54	103·700 103·920 103·730	103·810 103·825	103·819	at div. 103 9 45 9 48 10 50 45	at div. 104 9 45 16,5 48 2 50 53	by div. 103 5 36,0 2 48,00	by div. 104 5 36,5 2 48,25	168,205
Continued.	824	Neg.	110·54 92·48 110·30 92·80	101·510 101·390 101·550	101·450 101·470	101·460	at div. 101 9 53 45,5 56 28 59 22	at div. 102 9 53 39 56 35 59 15	by div. 101 5 36,5 2 48,25	by div. 102 5 36,0 2 48,00	168,135

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=57·60 B=30·300	825	Pos.	92·80 114·40 93·40 114·00	103·600 103·900 103·700	103·750 103·800	103·775	at div. 103 10 2 6,5 5 3 7 42,5	at div. 104 10 2 11,5 4 58 7 48	by div. 103 5 36,0 2 48,00	by div. 104 5 36,5 2 48,25	* 168,194
June 8 T=57·60 B=30·000	826	Pos.	92·66 113·80 93·50 113·32	103·230 103·650 103·410	103·440 103·530	103·485	at div. 102 3 5 28,5 8 31 11 6	at div. 104 3 5 39 8 18 11 17	by div. 102 5 37,5 2 48,75	by div. 104 5 38,0 2 49,00	168,936
	827	Neg.	113·32 89·40 112·88 89·62	101·360 101·140 101·250	101·250 101·195	101·222	at div. 100 3 14 11,5 16 49 19 49	at div. 102 3 14 2 16 58 19 39	by div. 100 5 37,5 2 48,75	by div. 102 5 37,0 2 48,50	168,597
	828	Pos.	89·62 116·98 90·40 116·42	103·300 103·690 103·410	103·495 103·550	103·522	at div. 102 3 22 30 25 32 28 8	at div. 104 3 22 38 25 23,5 28 16,5	by div. 102 5 38,0 2 49,00	by div. 104 5 38,5 2 49,25	169,190
	829	Neg.	116·42 86·20 115·92 86·54	101·310 101·060 101·230	101·185 101·145	101·165	at div. 100 3 31 9,5 33 50 36 47	at div. 102 3 31 2 33 57 36 39,5	by div. 100 5 37,5 2 48,75	by div. 102 5 37,5 2 48,75	168,750
	830	Pos.	86·54 120·10 87·34 119·44	103·320 103·720 103·390	103·520 103·555	103·537	at div. 102 3 39 29,5 41 29 45 7	at div. 104 3 39 36 42 22 45 14	by div. 102 5 37,5 2 48,75	by div. 104 5 38,0 2 49,00	168,942
	831	Neg.	119·44 83·52 118·88 84·10	101·480 101·200 101·490	101·340 101·345	101·342	at div. 100 3 48 7 50 47,5 43 45	at div. 102 3 48 1 50 53,5 43 38,5	by div. 100 5 38,0 2 49,00	by div. 102 5 37,5 2 48,75	168,832
	832	Pos.	84·10 122·90 84·88 122·30	103·500 103·890 103·590	103·695 103·740	103·717	at div. 100 3 56 21 59 31 4 1 58,5	at div. 105 3 56 35 59 17 4 2 13	by div. 100 5 37,5 2 48,75	by div. 105 5 38,0 2 49,00	168,936
	833	Neg.	122·30 80·92 121·52 81·40	101·610 101·220 101·460	101·415 101·340	101·377	at div. 100 4 5 3 7 44,5 10 41	at div. 105 4 4 50 7 58 10 27,5	by div. 100 5 38,0 2 49,00	by div. 105 5 37,5 2 48,75	168,931
	834	Pos.	81·40 125·40 82·42 124·70	103·400 103·910 103·560	103·655 103·735	103·695	at div. 100 4 13 19 16 26,5 18 56	at div. 105 4 13 31 16 14 19 9	by div. 100 5 37,0 2 48,5	by div. 105 5 38,0 2 49,0	168,869
	835	Neg.	124·70 78·52 124·00 79·30	101·610 101·260 101·650	101·435 101·455	101·445	at div. 100 4 21 59,5 24 42 27 37,5	at div. 105 4 21 48 24 53,5 27 25,5	by div. 100 5 38,0 2 49,00	by div. 105 5 37,5 2 48,75	168,928
Continued.	836	Pos.	79·30 127·80 80·08 126·60	103·550 103·940 103·340	103·745 103·640	103·692	at div. 100 4 30 16 33 21,5 35 53,5	at div. 105 4 30 27 33 10 36 5	by div. 100 5 37,5 2 48,75	by div. 105 5 38,0 2 49,00	168,935

17th SERIES cont.—2-inch *Lead* balls, with bifilar *iron* wire (shortened); dist. = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	837	Neg.	126·60 76·12 125·80 76·84	101·360 100·960 101·320	101·160 101·140	101·150	at div. 100 4 38 55 41 37 44 33	at div. 105 4 38 44 41 49 44 21,5	by div. 100 5 38,0 2 49,00	by div. 105 5 37,5 2 48,75	168,943
	838	Pos.	76·84 129·52 77·92 128·50	103·180 103·720 103·210	103·450 103·465	103·457	at div. 100 4 47 13,5 50 17 52 51	at div. 105 4 47 23,5 50 6 53 2	by div. 100 5 37,5 2 48,75	by div. 105 5 38,5 2 49,25	169,096
T = 58·08 B = 30·000	839	Neg.	128·50 74·48 127·52 75·38	101·490 101·000 101·450	101·245 101·225	101·235	at div. 100 4 55 51,5 58 35,5 5 1 29,5	at div. 105 4 55 41,5 58 45,5 5 1 19	by div. 100 5 38,0 2 49,00	by div. 105 5 37,5 2 48,75	168,938
June 9 T = 56·45 B = 29·980	840	Pos.	88·60 113·34 89·22 112·70	100·970 101·280 100·960	101·125 101·120	101·122	at div. 100 11 11 20 missed. 16 56,5	at div. 102 11 11 28,5 missed. 17 5,5	by div. 100 5 36,5 2 48,25	by div. 102 5 37,0 2 48,50	168,390
	841	Neg.	112·70 85·14 112·10 85·60	98·920 98·620 98·850	98·770 98·735	98·752	at div. 98 11 19 55 22 37 25 31	at div. 100 11 19 47 22 45 25 22,5	by div. 98 5 36,0 2 48,00	by div. 100 5 35,5 2 47,75	167,906
	842	Pos.	85·60 116·20 86·40 115·50	100·900 101·300 100·950	101·100 101·125	101·112	at div. 100 11 28 14 31 10 33 50	at div. 102 11 28 21 31 3 33 57,5	by div. 100 5 36,0 2 48,00	by div. 102 5 36,5 2 48,25	168,139
	843	Neg.	115·50 82·64 114·64 83·20	99·070 98·640 98·920	98·855 98·780	98·817	at div. 98 11 36 47,5 39 29,5 42 23	at div. 100 11 36 41 39 36 42 16	by div. 98 5 35,5 2 47,75	by div. 100 5 35,0 2 47,50	167,648
	844	Pos.	83·20 118·62 84·12 118·10	100·910 101·370 101·110	101·140 101·240	101·190	at div. 100 11 45 7 48 2,5 50 43	at div. 102 11 45 13 47 56 50 49	by div. 100 5 36,0 2 48,0	by div. 102 5 36,0 2 48,0	168,000
	845	Neg.	118·10 80·50 117·40 81·14	99·300 98·950 99·270	99·125 99·110	99·117	at div. 98 11 53 39 56 21 59 15	at div. 100 11 53 33 56 27 59 9	by div. 98 5 36,0 2 48,0	by div. 100 5 36,0 2 48,0	168,000
	846	Pos.	81·14 121·40 81·94 120·80	101·270 101·670 101·370	101·470 101·520	101·495	at div. 100 0 1 57,5 4 53,5 7 33	at div. 105 0 2 11 4 40 7 47	by div. 100 5 35,5 2 47,75	by div. 105 5 36,0 2 48,00	167,825
	847	Neg.	120·80 78·10 120·20 78·80	99·450 99·150 99·500	99·300 99·325	99·312	at div. 95 0 10 37,5 13 4 16 13,5	at div. 100 0 10 25 13 16,5 16 0,5	by div. 95 5 36,0 2 48,00	by div. 100 5 35,5 2 47,75	167,784
T = 56·65 B = 29·990	848	Pos.	78·80 123·92 79·70 123·40	101·360 101·810 101·550	101·585 101·680	101·632	at div. 100 0 18 48 21 43,5 24 23,5	at div. 105 0 19 0 21 32 24 36	by div. 100 5 35,5 2 47,75	by div. 105 5 36,0 2 48,00	167,832

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
June 9 T=56·65 B=29·990	849	Pos.	84·88 117·54 85·60 116·98	101·210 101·570 101·290	101·390 101·430	101·410	at div. 100 4 26 38,5 29 37 32 17	at div. 105 4 26 55 29 20,5 32 34	by div. 100 5 38,5 2 49,25	by div. 105 5 39,0 2 49,50	169,320
	850	Neg.	116·98 81·60 116·26 82·20	99·290 98·930 99·230	99·110 99·080	99·095	at div. 95 4 35 25,5 37 49,5 40 5	at div. 100 4 35 10 38 5 40 48,5	by div. 95 5 39,5 2 49,75	by div. 100 5 38,5 2 49,25	169,341
	851	Pos.	82·20 120·28 83·12 119·48	101·240 101·700 101·300	101·470 101·500	101·485	at div. 100 4 43 38,5 missed. 49 17	at div. 105 4 43 53 missed. 49 32	by div. 100 5 38,5 2 49,25	by div. 105 5 39,0 2 49,50	169,324
	852	Neg.	119·48 79·28 118·68 79·94	99·380 98·980 99·310	99·180 99·145	99·162	at div. 95 4 52 24 54 50 58 2,5	at div. 100 4 52 10 55 4 57 48	by div. 95 5 38,5 2 49,25	by div. 100 5 38,0 2 49,00	169,042
	853	Pos.	79·94 122·40 80·94 121·68	101·170 101·670 101·310	101·420 101·490	101·455	at div. 100 5 0 38 3 35 6 16	at div. 105 5 0 51 3 22 6 29,5	by div. 100 5 38,0 2 49,00	by div. 105 5 38,5 2 49,25	169,073
	854	Neg.	121·68 77·22 120·56 77·70	99·450 98·890 99·130	99·170 99·010	99·090	at div. 95 5 9 21 11 49 14 59	at div. 100 5 9 9 12 2 14 46,5	by div. 95 5 38,0 2 49,00	by div. 100 5 37,5 2 48,75	168,796
	855	Pos.	77·70 124·36 78·86 123·50	101·030 101·610 101·180	101·320 101·395	101·357	at div. 100 5 17 36,5 20 32 23 14	at div. 105 5 17 48 20 20 23 26,5	by div. 100 5 37,5 2 48,75	by div. 105 5 38,5 2 49,25	168,886
T=57·37 B=29·972	856	Nzg.	123·50 75·12 122·52 76·08	99·310 98·820 99·300	99·065 99·060	99·062	at div. 95 5 26 17,5 28 48,5 31 56	at div. 100 5 26 6,5 29 0 31 44,5	by div. 95 5 38,5 2 49,25	by div. 100 5 38,0 2 49,00	169,047
June 10 T=57·50 B=29·750	857	Pos.	87·12 116·80 88·06 115·12	101·960 102·430 101·590	102·195 102·010	102·102	at div. 102 3 40 58,5 43 45 46 36,5	at div. 104 3 41 6 43 37,5 46 44,5	by div. 102 5 38,0 2 49,00	by div. 104 5 38,5 2 49,25	169,013
	858	Neg.	115·12 84·22 114·58 84·70	99·670 99·400 99·640	99·535 99·520	99·527	at div. 98 3 49 32 52 11 55 11,5	at div. 100 3 49 25 52 18 55 4	by div. 98 5 39,5 2 49,75	by div. 100 5 39,0 2 49,50	169,559
	859	Pos.	84·70 118·48 85·72 117·60	101·590 102·100 101·660	101·845 101·880	101·862	at div. 100 3 57 52,5 4 0 53 3 28,5	at div. 102 3 57 58 4 0 46 3 35	by div. 100 5 37,0 2 48,5	by div. 102 5 37,0 2 48,5	168,500
Continued.	860	Neg.	117·60 82·00 116·86 82·80	99·800 99·430 99·830	99·615 99·630	99·622	at div. 98 4 6 31 9 10 12 9,5	at div. 100 4 6 25 9 16 12 3	by div. 98 5 38,5 2 49,25	by div. 100 5 38,0 2 49,00	169,047

17th SERIES cont.—2-inch *Lead* balls, with bifilar *iron* wire (shortened); dist. =·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	861	Pos.	82·80 120·50 83·92 119·60	101·650 102·210 101·760	101·930 101·985	101·957	at div. 100 4 14 50,5 17 51,5 20 28,5	at div. 105 4 15 5 17 36,5 20 43,5	by div. 100 5 38,0 2 49,00	by div. 105 5 38,5 2 49,25	• 169,098
	862	Neg.	119·60 80·32 118·62 81·28	99·960 99·470 99·950	99·715 99·710	99·712	at div. 95 4 23 38,5 26 1 29 17,5	at div. 100 4 23 25 26 15,5 29 3	by div. 95 5 39,0 2 49,5	by div. 100 5 38,0 2 49,0	169,029
	863	Pos.	81·28 122·30 82·38 121·32	101·790 102·340 101·850	102·065 102·095	102·080	at div. 100 4 31 49 34 49,5 37 27	at div. 105 4 32 2,5 34 36 37 41	by div. 100 5 38,0 2 49,00	by div. 105 5 38,5 2 49,25	169,104
	864	Neg.	121·32 78·94 120·18 80·00	100·130 99·610 100·140	99·870 99·875	99·872	at div. 95 4 40 36 42 59,5 46 15	at div. 100 4 40 23,5 43 13 46 1,5	by div. 95 5 39,0 2 49,5	by div. 100 5 38,0 2 49,0	169,013
	865	Pos.	80·00 123·80 81·26 122·68	101·900 102·530 101·970	102·215 102·250	102·232	at div. 100 4 48 47,5 51 48 54 25,5	at div. 105 4 49 0 51 35 54 38,5	by div. 100 5 38,0 2 49,00	by div. 105 5 38,5 2 49,25	169,112
	866	Neg.	122·68 77·70 121·46 78·90	100·190 99·580 100·180	99·885 99·880	99·882	at div. 95 4 57 34 59 59 5 3 13	at div. 100 4 57 22 5 0 11,5 3 0	by div. 95 5 39,0 2 49,5	by div. 100 5 38,0 2 49,0	169,012
	867	Pos.	78·90 124·88 80·30 123·60	101·890 102·590 101·950	102·240 102·270	102·255	at div. 100 5 5 46 8 46 11 24	at div. 105 5 5 58 8 34 11 36,5	by div. 100 5 38,0 2 49,00	by div. 105 5 38,5 2 49,25	168,887
	868	Neg.	123·60 77·08 122·32 78·20	100·340 99·700 100·260	100·020 99·980	100·000	at div. 95 5 14 32 16 57,5 20 11	at div. 100 5 14 20,5 17 9,5 19 58,5	by div. 95 5 39,0 2 49,5	by div. 100 5 38,0 2 49,0	169,000
	869	Pos.	78·20 125·68 79·58 124·40	101·940 102·630 101·990	102·285 102·310	102·297	at div. 100 5 22 44 25 44 28 22	at div. 105 5 22 55,5 25 32 28 34	by div. 100 5 38,0 2 49,00	by div. 105 5 38,5 2 49,25	169,115
T = 59·10 B = 29·742	870	Neg.	124·40 76·30 123·00 77·60	100·350 99·650 100·300	100·000 99·975	99·987	at div. 95 5 31 29 33 55 37 8	at div. 100 5 31 18 34 7 36 56	by div. 95 5 39,0 2 49,5	by div. 100 5 38,0 2 49,0	169,001
June 11 T = 59·15 B = 29·750	871	Pos.	79·52 122·40 80·52 121·50	100·960 101·460 101·010	101·210 101·235	101·222	at div. 100 10 4 1,5 6 46 9 38	at div. 105 10 4 14 6 33 9 51	by div. 100 5 36,5 2 48,25	by div. 105 5 37,0 2 48,50	168,311
Continued.	872	Neg.	121·50 76·90 120·46 77·70	99·200 98·680 99·080	98·940 98·880	98·910	at div. 95 10 12 40,5 15 9 18 16,5	at div. 100 10 12 28,5 15 21 18 4	by div. 95 5 36,0 2 48,00	by div. 100 5 35,5 2 47,75	167,805

17th Series cont.—2-inch *Lead* balls, with bifilar *iron* wire (shortened); dist. = ·415 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	873	Pos.	77·70 124·18 78·80 123·28	100·940 101·490 101·040	101·215 101·265	101·240	at div. 100 10 20 53,5 23 48 26 29,5	at div. 105 10 21 5 23 36 26 41,5	by div. 100 5 36,0 2 48,00	by div. 105 5 36,5 2 48,25	168,062
	874	Neg.	123·28 75·20 122·40 76·08	99·240 98·800 99·240	99·020 99·020	99·020	at div. 95 10 29 31 32 2 35 7,5	at div. 100 10 29 20 32 13 34 56	by div. 95 5 36,5 2 48,25	by div. 100 5 36,0 2 48,00	168,049
	875	Pos.	76·08 126·00 77·28 125·08	101·040 101·640 101·180	101·340 101·410	101·375	at div. 100 10 37 45 40 39 43 21	at div. 105 10 37 56 40 27,5 43 32,5	by div. 100 5 36,0 2 48,00	by div. 105 5 36,5 2 48,25	168,069
	876	Neg.	125·08 73·80 123·88 74·68	99·440 98·840 99·280	99·140 99·060	99·100	at div. 95 10 46 22 48 52,5 51 58	at div. 100 10 46 11,5 49 3 51 47	by div. 95 5 36,0 2 48,00	by div. 100 5 35,5 2 47,75	167,795
	877	Pos.	74·68 127·42 75·78 126·50	101·050 101·600 101·140	101·325 101·370	101·347	at div. 100 10 54 36 57 30 11 0 11,5	at div. 105 10 54 46 57 19,5 11 0 22	by div. 100 5 35,5 2 47,75	by div. 105 5 36,0 2 48,00	167,817
T=59·17 B=29·756	878	Neg.	126·50 72·30 125·52 73·28	99·400 98·910 99·400	99·155 99·155	99·155	at div. 95 11 3 12 5 43 8 48	at div. 100 11 3 2 5 53 8 38	by div. 95 5 36,0 2 48,0	by div. 100 5 36,0 2 48,0	168,000

18th Series.—2½-inch *Lead* balls, with bifilar *brass* wire; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
June 14 T=56·83 B=30·092	879	Pos.	80·40 112·20 80·80 111·60	96·300 96·500 96·200	96·400 96·350	96·375	at div. 95 7 7 11 11 9 14 40,5	at div. 100 7 7 33 10 46 15 4	by div. 95 7 29,5 3 44,75	by div. 100 7 31,0 3 45,50	224,956
	880	Neg.	111·60 72·92 110·80 73·48	92·260 91·860 92·140	92·060 92·000	92·030	at div. 90 7 18 43,5 22 13 26 13	at div. 95 7 18 25 22 31,5 25 53,5	by div. 90 7 29,5 3 44,75	by div. 95 7 28,5 3 44,25	224,547
	881	Pos.	73·48 118·40 74·44 117·60	95·940 96·420 96·020	96·180 96·220	96·200	at div. 95 7 29 50 33 42,5 37 20	at div. 100 7 30 6,5 33 26 37 37	by div. 95 7 30,0 3 45,00	by div. 100 7 30,5 3 45,25	225,060
	882	Neg.	117·60 66·66 116·50 67·30	92·130 91·580 91·900	91·855 91·740	91·797	at div. 90 7 41 17 44 52 48 47	at div. 95 7 41 3 45 6,5 48 32,5	by div. 90 7 30,0 3 45,00	by div. 95 7 29,5 3 44,75	224,910
Continued.	883	Pos.	67·30 123·90 68·28 122·98	95·600 96·090 95·630	95·845 95·860	95·852	at div. 95 7 52 27,5 56 17 59 58	at div. 100 7 52 40 56 3,5 8 0 11	by div. 95 7 30,5 3 45,25	by div. 100 7 31,0 3 45,50	225,293

18th Series continued.—2½-inch *Lead* balls, with bifilar *brass* wire; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	884	Neg.	122·98 60·70 121·74 61·48	91·840 91·220 91·610	91·530 91·415	91·472	at div. 90 8 3 51 7 29 11 21	at div. 95 8 3 39,5 7 41 11 9	by div. 90 7 30,0 3 45,00	by div. 95 7 29,5 3 44,75	* 224,926
T=56·87 B=30·092	885	Pos.	61·48 128·92 62·52 127·80	95·200 95·720 95·160	95·460 95·440	95·450	at div. 95 8 15 4 missed. 22 35	at div. 100 8 15 15 missed. 22 46	by div. 95 7 31,0 3 45,50	by div. 100 7 31,0 3 45,50	225,500
June 15 T=61·35 B=29·942	886	Pos.	80·90 116·70 81·40 116·18	98·800 99·050 98·790	98·925 98·920	98·922	at div. 95 7 3 12 7 32 10 46	at div. 100 7 3 32,5 7 11 11 7	by div. 95 7 34,0 3 47,00	by div. 100 7 34,5 3 47,25	227,196
	887	Neg.	116·18 73·32 115·34 73·70	94·750 94·330 94·520	94·540 94·425	94·482	at div. 90 7 15 8 18 23 22 42	at div. 95 7 14 51 18 41 22 24,5	by div. 90 7 34,0 3 47,00	by div. 95 7 33,5 3 46,75	226,776
	888	Pos.	73·70 123·10 74·50 122·36	98·400 98·800 98·430	98·600 98·615	98·607	at div. 95 7 26 5 30 14,5 33 39,5	at div. 100 7 26 20 30 0 33 55	by div. 95 7 34,5 3 47,25	by div. 100 7 35,0 3 47,50	227,430
	889	Neg.	122·36 66·60 121·44 67·20	94·480 94·020 94·320	94·250 94·170	94·210	at div. 90 7 37 51 41 15 45 24	at div. 95 7 37 38 41 28,5 45 11	by div. 90 7 33,0 3 46,5	by div. 95 7 33,0 3 46,5	226,500
	890	Pos.	67·20 129·02 68·00 128·08	98·110 98·510 98·040	98·310 98·275	98·295	at div. 95 7 48 55 52 57,5 56 28	at div. 100 7 49 6,5 52 45,5 56 40	by div. 95 7 33,0 3 46,50	by div. 100 7 33,5 3 46,75	226,665
	891	Neg.	128·08 60·30 127·00 61·10	94·190 93·650 94·050	93·920 93·850	93·885	at div. 90 8 0 33,5 4 3 8 7	at div. 95 8 0 22,5 4 14 7 55,5	by div. 90 7 33,5 3 46,75	by div. 95 7 33,0 3 46,50	226,556
	892	Pos.	61·10 134·48 62·08 133·42	97·790 98·280 97·750	98·035 98·015	98·025	at div. 95 8 11 40,5 15 40 19 14	at div. 100 8 11 50,5 15 29,5 19 24	by div. 95 7 33,5 3 46,75	by div. 100 7 33,5 3 46,75	226,750
	893	Neg.	133·42 54·56 132·20 55·50	93·990 93·380 93·850	93·685 93·615	93·650	at div. 90 8 23 15 26 48,5 30 48,5	at div. 95 8 23 6 26 57,5 30 39	by div. 90 7 33,5 3 46,75	by div. 95 7 33,0 3 46,50	226,568
			Here I	was inter torsion	rupted for rod was	upwards put in	of two hours: motion by the	and, when I re Hook's joint.	commenced,	the	
Continued.	894	Pos.	71·90 137·96 72·90 136·94	104·930 105·430 104·920	105·180 105·175	105·177	at div. 105 10 58 9 11 1 57 5 43	at div. 110 10 58 20 11 1 46 5 54,5	by div. 105 7 34,0 3 47,00	by div. 110 7 34,5 3 47,25	227,009

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	895	Neg.	136·94 65·30 135·74 66·18	101·120 100·520 100·960	100·820 100·740	100·780	at div. 100 11 9 33 13 16 17 5	at div. 105 11 9 22,5 13 26 16 54,5	by div. 100 7 32,0 3 46,0	by div. 105 7 32,0 3 46,0	* 226,000
	896	Pos.	66·18 143·20 67·22 141·92	104·690 105·210 104·570	104·950 104·890	104·920	at div. 100 11 20 42,5 24 48 28 15	at div. 105 11 20 52 24 38,5 28 25	by div. 100 7 32,5 3 46,25	by div. 105 7 33,0 3 46,50	226,496
T = B =	897	Nag.	141·92 59·80 140·52 60·84	100·860 100·160 100·680	100·510 100·420	100·465	at div. 100 11 32 14 35 58,5 39 46,5	at div. 105 11 32 5 36 7,5 39 37	by div. 100 7 32,5 3 46,25	by div. 105 7 32,0 3 46,00	226,227
June 16 T = 60·33 B = 30·262	898	Pos.	80·40 123·00 81·10 122·30	101·700 102·050 101·700	101·875 101·875	101·875	at div. 100 9 50 28 missed. 57 58	at div. 105 9 50 45 missed. 58 15,5	by div. 100 7 30,0 3 45,00	by div. 105 7 30,5 3 45,25	225,094
	899	Neg.	122·30 73·30 121·40 73·96	97·800 97·350 97·680	97·575 97·515	97·545	at div. 95 10 1 59,5 5 29,5 9 29,5	at div. 100 10 1 44,5 5 44,5 9 14	by div. 95 7 30,0 3 45,00	by div. 100 7 29,5 3 44,75	224,873
	900	Pos.	73·96 128·88 74·90 127·94	101·420 101·890 101·420	101·655 101·655	101·655	at div. 100 10 13 6 17 0 20 36	at div. 105 10 13 19 16 46,5 20 49,5	by div. 100 7 30,0 3 45,00	by div. 105 7 30,5 3 45,25	225,083
	901	Neg.	127·94 67·34 126·92 68·20	97·640 97·130 97·560	97·385 97·345	97·365	at div. 95 10 24 33 28 7 32 3	at div. 100 10 24 21 28 19 31 51	by div. 95 7 30,0 3 45,0	by div. 100 7 30,0 3 45,0	225,000
	902	Pos.	68·20 134·40 69·28 133·40	101·300 101·840 101·340	101·570 101·590	101·580	at div. 100 10 35 41 39 33 43 11	at div. 105 10 35 52 39 22 43 22	by div. 100 7 30,0 3 45,0	by div. 105 7 30,0 3 45,0	225,000
	903	Nag.	133·40 61·80 132·30 62·72	97·600 97·050 97·510	97·325 97·280	97·302	at div. 95 10 47 6 50 41,5 54 35,5	at div. 100 10 46 56 50 52 54 25	by div. 95 7 29,5 3 44,75	by div. 100 7 29,0 3 44,50	224,635
	904	Pos.	62·72 139·62 63·86 138·50	101·170 101·740 101·180	101·455 101·460	101·457	at div. 100 10 58 15 11 2 5 5 44,5	at div. 105 10 58 24 11 1 55,5 5 54	by div. 100 7 29,5 3 44,75	by div. 105 7 30,0 3 45,00	224,823
	905	Neg.	138·50 56·50 137·26 57·50	97·500 96·880 97·380	97·190 97·130	97·160	at div. 95 11 9 37,5 13 14,5 17 7	at div. 100 11 9 29 13 23,5 16 58	by div. 95 7 29,5 3 44,75	by div. 100 7 29,0 3 44,50	224,642
Continued.	906	Pos.	57·50 144·44 58·70 143·28	100·970 101·570 100·990	101·270 101·280	101·275	at div. 100 11 20 48 24 37 28 18	at div. 105 11 20 56 24 28,5 28 26,5	by div. 100 7 30,0 3 45,00	by div. 105 7 30,5 3 45,25	225,064

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18th Series continued.—2½-inch *Lead* balls, with bifilar *brass* wire; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	907	Neg.	143·28 51·46 141·80 52·70	97·370 96·630 97·250	97·000 96·940	96·970	at div. 95 11 32 9,5 35 48 39 40	at div. 100 11 32 1,5 35 56,5 39 31,5	by div. 95 7 30,5 3 45,25	by div. 100 7 30,0 3 45,00	• 225,152
	908	Pos.	52·70 149·00 54·10 147·60	100·850 101·550 100·850	101·200 101·200	101·200	at div. 100 11 43 21,5 47 10,5 50 52	at div. 105 11 43 29 47 3 51 0	by div. 100 7 30,5 3 45,25	by div. 105 7 31,0 3 45,50	225,310
	909	Neg.	147·60 46·92 146·08 48·28	97·260 96·500 97·180	96·880 96·840	96·860	at div. 95 11 54 43,5 58 24 0 2 14,5	at div. 100 11 54 36 58 31 0 2 7	by div. 95 7 31,0 3 45,5	by div. 100 7 31,0 3 45,5	225,500
	910	Pos.	48·28 153·00 49·94 151·48	100·640 101·470 100·710	101·055 101·090	101·072	at div. 100 0 5 57 9 46 13 27,5	at div. 105 0 6 4 9 39 13 35	by div. 100 7 30,5 3 45,25	by div. 105 7 31,0 3 45,50	225,303
T = 60·88 B = 30·250	911	Neg.	151·48 42·88 149·68 44·00	97·180 96·280 96·840	96·730 96·560	96·645	at div. 95 0 17 19 missed. 24 49,5	at div. 100 0 17 12 missed. 24 42,5	by div. 95 7 30,5 3 45,25	by div. 100 7 30,5 3 45,25	225,250
June 17 T = 61·81 B = 30·130	912	Pos.	81·80 118·44 82·50 117·98	100·120 100·470 100·240	100·295 100·355	100·325	at div. 100 9 47 28,5 51 16,5 55 0	at div. 105 9 47 48,5 50 56,5 55 20,5	by div. 100 7 31,5 3 45,75	by div. 105 7 32,0 3 46,00	225,766
	913	Neg.	117·98 74·68 117·28 75·30	96·330 95·980 96·290	96·155 96·135	96·145	at div. 95 9 58 54 10 2 32 6 25,5	at div. 100 9 58 37 10 2 49 6 8	by div. 95 7 31,5 3 45,75	by div. 100 7 31,0 3 45,50	225,693
	914	Pos.	75·30 125·00 76·08 124·32	100·150 100·540 100·200	100·345 100·370	100·357	at div. 100 10 10 9 13 57 17 40	at div. 105 10 10 23,5 13 42 17 55	by div. 100 7 31,0 3 45,50	by div. 105 7 31,5 3 45,75	225,518
	915	Neg.	124·32 68·30 123·34 68·92	96·310 95·820 96·130	96·065 95·975	96·020	at div. 95 10 21 32 25 12 29 3	at div. 100 10 21 19 25 25,5 28 49,5	by div. 95 7 31,0 3 45,50	by div. 100 7 30,5 3 45,25	225,449
	916	Pos.	68·92 130·90 69·92 130·08	99·910 100·410 100·000	100·160 100·205	100·182	at div. 100 10 32 48,5 36 35 40 19,5	at div. 105 10 33 0 36 23 40 31,5	by div. 100 7 31,0 3 45,50	by div. 105 7 31,5 3 45,75	225,509
	917	Neg.	130·08 62·30 129·02 63·18	96·190 95·660 96·100	95·925 95·880	95·902	at div. 95 10 44 9,5 47 51,5 51 40,5	at div. 100 10 43 59 48 2 51 29,5	by div. 95 7 31,0 3 45,50	by div. 100 7 30,5 3 45,25	225,455
Continued.	918	Pos.	63·18 136·52 64·22 135·54	99·850 100·370 99·880	100·110 100·125	100·117	at div. 100 10 55 25,5 59 12 11 2 57	at div. 105 10 55 35,5 59 2 11 3 7,5	by div. 100 7 31,5 3 45,75	by div. 105 7 32,0 3 46,00	225,756

18th Series continued.—2½-inch *Lead* balls, with bifilar *brass* wire; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times. h m s	Observed Times. h m s	2 N m s	2 N m s	N for Mean Resting Point.
Continued.	919	Neg.	135·54 56·74 134·30 57·72	96·140 95·520 96·010	95·830 95·765	95·797	at div. 95 11 6 46 10 28,5 14 17	at div. 100 11 6 37 10 38 14 7,5	by div. 95 7 31,0 3 45,50	by div. 100 7 30,5 3 45,25	225,460
	920	Pos.	57·72 141·70 58·90 140·52	99·710 100·300 99·710	100·005 100·005	100·005	at div. 100 11 18 3 21 48,5 25 34,5	at div. 105 11 18 11,5 21 40 25 43	by div. 100 7 31,5 3 45,75	by div. 105 7 31,5 3 45,75	225,750
	921	Neg.	140·52 51·52 139·22 52·70	96·020 95·370 95·960	95·695 95·665	95·680	at div. 95 11 29 22,5 33 5,5 36 54	at div. 100 11 29 14,5 33 14 36 45,5	by div. 95 7 31,5 3 45,75	by div. 100 7 31,0 3 45,50	225,716
	922	Pos.	52·70 146·48 54·08 145·12	99·590 100·280 99·600	99·935 99·940	99·937	at div. 95 11 40 32 44 33 48 3,5	at div. 100 11 40 40 44 25,5 48 11,5	by div. 95 7 31,5 3 45,75	by div. 100 7 31,5 3 45,75	225,750
	923	Neg.	145·12 46·88 143·68 48·18	96·000 95·280 95·930	95·640 95·605	95·622	at div. 95 11 51 59 55 43 59 30,5	at div. 100 11 51 52 55 50,5 59 23	by div. 95 7 31,5 3 45,75	by div. 100 7 31,0 3 45,50	225,719
	924	Pos.	48·18 150·62 49·70 149·12	99·400 100·160 99·410	99·780 99·785	99·782	at div. 95 0 3 10 7 9,5 10 41,5	at div. 100 0 3 17 7 2,5 10 49	by div. 95 7 31,5 3 45,75	by div. 100 7 32,0 3 46,00	225,989
	925	Neg.	149·12 42·70 147·40 44·22	95·910 95·050 95·810	95·480 95·430	95·455	at div. 95 0 14 36 18 20,5 22 7	at div. 100 0 14 29,5 18 27 22 0,5	by div. 95 7 31,0 3 45,5	by div. 100 7 31,0 3 45,5	225,500
	926	Pos.	44·22 154·20 46·00 152·40	99·210 100·100 99·200	99·655 99·650	99·652	at div. 95 0 25 48 29 46 33 19	at div. 100 0 25 54,5 29 39,5 33 26	by div. 95 7 31,0 3 45,50	by div. 100 7 31,5 3 45,75	225,732
	927	Neg.	152·40 39·40 150·42 41·10	95·900 94·910 95·760	95·405 95·335	95·370	at div. 95 0 37 13,5 40 58,5 44 44,5	at div. 100 0 37 7 41 5 44 38	by div. 95 7 31,0 3 45,5	by div. 100 7 31,0 3 45,5	225,500
T = 62·47 B = 30·100	928	Pos.	41·10 157·18 42·90 155·30	99·140 100·040 99·100	99·590 99·570	99·580	at div. 95 0 48 25 missed. 55 56,5	at div. 100 0 48 31,5 missed. 56 3	by div. 95 7 31,5 3 45,75	by div. 100 7 31,5 3 45,75	225,750

19th Series.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·380 inch.

June 18 T = 65·50 B = 29·716 Continued.	929	Pos.	87·60 115·20 88·34 114·70	101·400 101·770 101·520	101·587 101·645	101·616	at div. 100 4 48 20 52 39 56 19,5	at div. 105 4 48 49 52 10 56 49	by div. 100 7 59,5 3 59,75	by div. 105 8 0,0 4 0,00	239,831

19th SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	950	Neg.	114·70 79·50 113·80 80·14	97·100 96·650 96·970	96·875 96·810	96·842	at div. 95 5 0 42 4 25 8 41	at div. 100 5 0 19,5 4 48 8 18	by div. 95 7 59,0 5 59,50	by div. 100 7 58,5 3 59,25	• 239,408
	931	Pos.	80·14 122·60 81·10 121·80	101·370 101·850 101·450	101·610 101·650	101·650	at div. 100 5 12 30 16 42 20 29	at div. 105 5 12 48 16 25 20 48	by div. 100 7 59,0 3 59,50	by div. 105 8 0,0 4 0,00	239,663
T=65·50 B=29·716	932	Neg.	121·80 72·50 120·70 73·40	97·150 96·600 97·050	96·875 96·825	96·850	at div. 95 5 24 43 28 30,5 32 42	at div. 100 5 24 27,5 28 47 52 25,5	by div. 95 7 59,0 3 59,5	by div. 100 7 58,0 3 59,0	239,315
June 19 T=66·20 B=29·676	935	Pos.	51·10 141·52 52·70 140·32	96·310 97·110 96·510	96·710 96·810	96·760	at div. 95 10 58 35,5 42 45,5 46 36	at div. 100 10 38 43 42 38 46 44	by div. 95 8 0,5 4 0,25	by div. 100 8 1,0 4 0,50	240,338
	934	Neg.	140·32 45·40 140·00 46·62	92·860 92·700 93·310	92·780 93·005	92·892	at div. 90 10 50 48 54 39 58 49	at div. 95 10 50 40,5 54 46 58 41,5	by div. 90 8 1,0 4 0,5	by div. 95 8 1,0 4 0,5	240,500
	935	Pos.	46·62 148·72 48·20 147·44	97·670 98·460 97·820	98·065 98·140	98·102	at div. 95 11 14 29 18 56,5 22 30,5	at div. 100 11 14 37,5 18 27,5 22 39,5	by div. 95 8 1,5 4 0,75	by div. 100 8 2,0 4 1,00	240,905
T=66·20 B=29·676	936	Neg.	147·44 39·92 145·88 41·34	93·680 92·900 93·610	93·290 95·255	93·272	at div. 90 11 26 41,5 30 52 34 43	at div. 95 11 26 53,5 30 40 54 35	by div. 90 8 1,5 4 0,75	by div. 95 8 1,5 4 0,75	240,750
June 20 T=64·97 B=29·832	957	Pos.	89·00 117·18 89·54 116·72	105·090 103·360 105·150	105·225 103·245	103·235	at div. 100 10 18 41 25 17,5 26 41	at div. 105 10 19 8,5 22 49,5 27 9,5	by div. 100 8 0,0 4 0,0	by div. 105 8 1,0 4 0,5	240,325
	938	Neg.	116·72 80·34 116·10 80·86	98·530 98·220 98·480	98·375 98·350	98·362	at div. 95 10 31 18 34 49,5 59 19	at div. 100 10 50 56,5 55 11 58 57	by div. 95 8 1,0 4 0,50	by div. 100 8 0,5 4 0,25	240,552
	939	Pos.	80·86 125·12 81·52 124·44	102·990 105·320 102·980	103·155 105·150	105·152	at div. 100 10 42 57,5 47 20 50 58,5	at div. 105 10 43 15 47 3 51 16,5	by div. 100 8 1,0 4 0,50	by div. 105 8 1,5 4 0,75	240,658
	940	Neg.	124·44 72·50 123·60 75·24	98·470 98·050 98·420	98·260 98·235	98·247	at div. 95 10 55 23 59 4,5 11 3 24,5	at div. 100 10 55 8,5 59 19,5 11 3 9,5	by div. 95 8 1,5 4 0,75	by div. 100 8 1,0 4 0,50	240,588
Continued.	941	Pos.	73·24 132·54 74·18 151·78	102·890 103·360 102·980	105·125 105·170	105·147	at div. 100 11 7 9,5 11 27 15 10,5	at div. 105 11 7 22,5 11 14 15 24	by div. 100 8 1,0 4 0,50	by div. 105 8 1,5 4 0,75	240,657

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19th Series continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	942	Neg.	131·78 65·48 130·80 66·48	98·630 98·140 98·640	98·385 98·390	98·387	at div. 95 11 19 29 23 14 27 30	at div. 100 11 19 17,5 23 25,5 27 18	by div. 95 8 1,0 4 0,50	by div. 100 8 0,5 4 0,25	240,331
	943	Pos.	66·48 139·50 67·70 138·52	102·990 103·600 103·110	103·295 103·355	103·325	at div. 100 11 31 17 35 31,5 39 17,5	at div. 105 11 31 27,5 35 21 39 28	by div. 100 8 0,5 4 0,25	by div. 105 8 0,5 4 0,25	240,250
	944	Neg.	138·52 58·88 137·30 60·12	98·700 98·090 98·710	98·395 98·400	98·397	at div. 95 11 43 33 47 20 51 34	at div. 100 11 43 23,5 47 30 54 24	by div. 95 8 1,0 4 0,50	by div. 100 8 0,5 4 0,25	240,330
	945	Pos.	60·12 145·80 61·52 144·60	102·960 103·660 103·060	103·310 103·360	103·335	at div. 100 11 55 23 59 35,5 0 3 23,5	at div. 105 11 55 32 59 26,5 0 3 32,5	by div. 100 8 0,5 4 0,25	by div. 105 8 0,5 4 0,25	240,250
	946	Neg.	144·60 53·10 143·28 54·32	98·850 98·190 98·800	98·520 98·495	98·507	at div. 95 0 7 37 11 25 15 37,5	at div. 100 0 7 28,5 11 34 15 28,5	by div. 95 8 0,5 4 0,25	by div. 100 8 0,0 4 0,00	240,075
	947	Pos.	54·32 151·50 55·88 150·06	102·910 103·690 102·970	103·300 103·330	103·315	at div. 100 0 19 28 23 39 27 28,5	at div. 105 0 19 36 23 31 27 36,5	by div. 100 8 0,5 4 0,25	by div. 105 8 0,5 4 0,25	240,250
T=65·43 B=	948	Neg.	150·06 47·68 148·50 49·12	98·870 98·090 98·810	98·480 98·450	98·465	at div. 95 0 31 40,5 35 30 39 41	at div. 100 0 31 23 35 38 39 33,5	by div. 95 8 0,5 4 0,25	by div. 100 8 0,5 4 0,25	240,250
June 21 T=64·25 B=29·800	949	Pos.	87·92 117·82 88·50 117·28	102·870 103·160 102·890	103·015 103·025	103·020	at div. 100 6 16 22 20 54 24 22,5	at div. 105 6 16 48 20 28 24 49	by div. 100 8 0,5 4 0,25	by div. 105 8 1,0 4 0,50	240,401
	950	Neg.	117·28 79·36 116·68 79·90	98·320 98·020 98·290	98·170 98·155	98·162	at div. 95 6 28 55,5 32 30 36 16	at div. 100 6 28 35 32 50,5 36 35	by div. 95 8 0,5 4 0,25	by div. 100 8 0,0 4 0,00	240,092
	951	Pos.	79·90 125·50 80·84 124·92	102·700 103·170 102·880	102·935 103·025	102·980	at div. 100 6 40 38 44 58 48 37,5	at div. 105 6 40 55 44 41 48 55	by div. 100 7 59,5 3 59,75	by div. 105 8 0,0 4 0,00	239,900
	952	Neg.	124·92 72·10 124·02 73·10	98·510 98·060 98·560	98·285 98·310	98·297	at div. 95 6 53 1,5 56 42 7 1 2,5	at div. 100 6 52 47 56 57,5 7 0 47,5	by div. 95 8 1,0 4 0,50	by div. 100 8 0,5 4 0,25	240,335
Continued.	953	Pos.	73·10 132·94 74·18 132·08	103·020 103·560 103·130	103·290 103·345	103·317	at div. 100 7 4 47 9 4,5 12 47	at div. 105 7 5 0 8 51,5 13 0	by div. 100 8 0,0 4 0,0	by div. 105 8 0,0 4 0,0	240,000

19th SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	954	Neg.	132·08 65·50 130·90 66·50	98·790 98·200 98·700	98·495 98·450	98·472	at div. 95 7 17 6,5 20 50,5 25 6,5	at div. 100 7 16 55 21 2 24 54,5	by div. 95 8 0,0 4 0,00	by div. 100 7 59,5 3 59,75	• 239,826
	955	Pos.	66·50 139·40 67·80 138·30	102·950 103·600 103·050	103·275 103·325	103·300	at div. 100 7 28 54 33 8 36 53,5	at div. 105 7 29 4,5 32 57,5 37 4,5	by div. 100 7 59,5 3 59,75	by div. 105 8 0,0 4 0,00	239,914
	956	Neg.	138·30 59·28 137·00 60·60	98·790 98·140 98·800	98·465 98·470	98·467	at div. 95 7 41 9,5 44 56 49 9,5	at div. 100 7 40 59,5 45 6 48 59,5	by div. 95 8 0,0 4 0,0	by div. 100 8 0,0 4 0,0	240,000
	957	Pos.	60·60 145·70 62·20 144·70	103·150 103·950 103·450	103·550 103·700	103·625	at div. 100 7 52 58 57 11 8 0 57	at div. 105 7 53 7 57 2 8 1 6,5	by div. 100 7 59,0 3 59,50	by div. 105 7 59,5 3 59,75	239,681
	958	Neg.	144·70 54·00 143·50 55·50	99·350 98·750 99·500	99·050 99·125	99·087	at div. 95 8 5 12 8 58 13 12	at div. 100 8 5 3,5 9 6,5 13 3	by div. 95 8 0,0 4 0,00	by div. 100 7 59,5 3 59,75	239,796
				Here I	was in	terrupted	for nearly two	hours.			
	959	Pos.	66·12 141·30 67·18 140·20	103·710 104·240 103·690	103·975 103·965	103·970	at div. 100 10 8 21,5 12 38,5 16 22	at div. 105 10 8 31,5 12 28 16 32,5	by div. 100 8 0,5 4 0,25	by div. 105 8 1,0 4 0,50	240,448
	960	Neg.	140·20 58·72 138·90 59·80	99·460 98·810 99·350	99·135 99·080	99·107	at div. 95 10 20 40 24 24,5 28 40,5	at div. 100 10 20 30,5 24 34 28 30,5	by div. 95 8 0,5 4 0,25	by div. 100 8 0,0 4 0,00	240,045
	961	Pos.	59·80 147·38 61·20 146·10	103·590 104·290 103·650	103·940 103·970	103·955	at div. 100 10 32 27 36 41 40 27,5	at div. 105 10 32 35,5 36 32,5 40 36	by div. 100 8 0,5 4 0,25	by div. 105 8 0,5 4 0,25	240,250
	962	Neg.	146·10 52·80 144·72 54·18	99·450 98·760 99·450	99·105 99·105	99·105	at div. 95 10 44 42,5 48 29 52 43	at div. 100 10 44 34,5 48 37,5 52 34,5	by div. 95 8 0,5 4 0,25	by div. 100 8 0,0 4 0,00	240,045
	963	Pos.	54·18 152·90 55·80 151·48	103·540 104·350 103·640	103·945 103·995	103·970	at div. 100 10 56 31,5 11 0 44 4 31,5	at div. 105 10 56 39 11 0 36 4 39,5	by div. 100 8 0,0 4 0,00	by div. 105 8 0,5 4 0,25	240,198
T = 64·63 B = 29·890	964	Neg.	151·48 47·68 149·86 49·20	99·580 98·770 99·530	99·175 99·150	99·162	at div. 95 11 8 45 12 33 16 45	at div. 100 11 8 38 12 40,5 16 37,5	by div. 95 8 0,0 4 0,00	by div. 100 7 59,5 3 59,75	239,792
	It was	in the	afternoon	of this	day that	I met	with the dread	ful accident	recorded in	page 66.	

19th SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
August 7 T=64·81 B=29·960	965	Pos.	91·50 115·40 91·90 115·04	105·450 103·650 103·470	105·550 105·560	103·555	at div. 103 7 3 18 missed. 11 19	at div. 104 7 3 24 missed. 11 25,5	by div. 105 8 1,0 4 0,50	by div. 104 8 1,5 4 0,75	240,639
	966	Neg.	115·04 82·60 114·60 83·10	98·820 98·600 98·850	98·710 98·725	98·717	at div. 98 7 15 31 19 25 23 52,5	at div. 99 7 15 26 19 30 23 27	by div. 98 8 1,5 4 0,75	by div. 99 8 1,0 4 0,50	240,571
	967	Pos.	83·10 125·78 85·96 125·50	103·440 105·870 105·630	103·655 105·750	103·702	at div. 100 7 27 20,5 31 50 35 21	at div. 105 7 27 59 51 30 55 41	by div. 100 8 0,5 4 0,25	by div. 105 8 2,0 4 1,00	240,805
	968	Neg.	125·50 74·90 122·52 75·60	99·100 98·710 99·060	98·905 98·885	98·895	at div. 95 7 39 52 43 28 47 53,5	at div. 100 7 59 56,5 45 44 47 57	by div. 95 8 1,5 4 0,75	by div. 100 8 0,5 4 0,25	240,361
	969	Pos.	75·60 151·52 76·50 130·80	103·560 104·010 105·650	105·785 105·850	105·807	at div. 100 7 51 35,5 55 55 59 54,5	at div. 105 7 51 47 55 41 59 48,5	by div. 100 8 1,0 4 0,50	by div. 105 8 1,5 4 0,75	240,690
T=64·91 B=29·972	970	Neg.	150·80 67·68 129·88 68·52	99·240 98·780 99·200	99·010 98·990	99·000	at div. 95 8 5 58 7 39 11 59	at div. 100 8 3 46 7 51 11 46,5	by div. 95 8 1,0 4 0,50	by div. 100 8 0,5 4 0,25	240,300
August 10 T=63·93 B=29·850	971	Pos.	90·44 115·50 91·40 113·50	101·970 102·450 102·450	102·210 102·450	102·330	at div. 102 6 32 33,5 missed. 40 25	at div. 105 6 52 40 missed. 40 52	by div. 102 7 51,5 3 55,75	by div. 103 7 52,0 3 56,00	255,915
	972	Neg.	113·50 82·54 115·00 83·16	98·020 97·770 98·080	97·895 97·925	97·910	at div. 97 6 44 57 48 28 52 55	at div. 98 6 44 52 48 32,5 52 30	by div. 97 7 58,0 3 59,0	by div. 98 7 58,0 3 59,0	239,000
	973	Pos.	83·16 122·06 84·18 121·42	102·610 105·120 102·800	102·865 102·960	102·912	at div. 100 6 56 23 7 0 45 4 20	at div. 105 6 56 42,5 7 0 25 4 40	by div. 100 7 57,0 5 58,50	by div. 105 7 57,5 5 58,75	238,646
	974	Neg.	121·42 75·32 120·48 76·10	98·370 97·900 98·290	98·155 98·095	98·115	at div. 95 7 8 ·45 12 22,5 16 42	at div. 100 7 8 28,5 12 59,5 16 25	by div. 95 7 57,0 5 58,50	by div. 100 7 56,5 3 58,25	238,344
	975	Pos.	76·10 129·12 77·16 128·20	102·610 103·140 102·680	102·875 102·910	102·892	at div. 100 7 20 25 24 41 28 22	at div. 105 7 20 39,5 24 26 28 37	by div. 100 7 57,0 3 58,50	by div. 105 7 57,5 3 58,75	258,645
Continued.	976	Neg.	128·20 68·70 127·10 69·74	98·450 97·900 98·420	98·175 98·160	98·167	at div. 95 7 52 40 56 23 40 58	at div. 100 7 32 27,5 56 36 40 25	by div. 95 7 58,0 3 59,00	by div. 100 7 57,5 3 58,75	258,842

19th SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·380 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	977	Pos.	69·74 135·44 71·12 134·22	102·590 103·280 102·670	102·935 102·975	102·955	at div. 100 7 44 24,5 48 38 52 22,5	at div. 105 7 44 36 48 26 52 34,5	by div. 100 7 58,0 3 59,00	by div. 105 7 58,5 3 59,25	239,148
T = 63·91 B = 29·872	978	Neg.	134·22 62·86 132·94 64·10	98·540 97·900 98·520	98·220 98·210	98·215	at div. 95 7 56 38 missed. 8 4 36	at div. 100 7 56 27 missed. 8 4 25	by div. 95 7 58,0 3 59,0	by div. 100 7 58,0 3 59,0	239,000

20th SERIES.—1½-inch *Platina* balls, with *single* copper wire; diameter = ·0219 inch.

August 20 T = 66·80 B = 30·066	979	Pos.	89·80 120·30 91·00 119·10	105·050 105·650 105·050	105·350 105·350	105·350	at div. 105 6 38 16 42 0 45 36,5	at div. 106 6 38 21 41 55 45 42	by div. 105 7 20,5 3 40,25	by div. 106 7 21,0 3 40,50	220,337
	980	Neg.	119·10 84·30 117·60 85·38	101·700 100·950 101·490	101·325 101·220	101·272	at div. 101 6 49 24 53 2,5 56 44,5	at div. 102 6 49 20 53 6,5 56 40	by div. 101 7 20,5 3 40,25	by div. 102 7 20,0 3 40,00	220,182
	981	Pos.	85·38 124·00 86·90 122·62	104·690 105·450 104·760	105·070 105·105	105·087	at div. 105 7 0 28 4 8,5 7 48	at div. 110 7 0 47 3 49,5 8 8	by div. 105 7 20,0 3 40,0	by div. 110 7 21,0 3 40,5	220,009
	982	Neg.	122·62 80·36 120·84 81·70	101·490 100·600 101·270	101·045 100·935	100·990	at div. 100 7 11 35 15 9 18 55	at div. 105 7 11 18,5 15 26,5 18 37,5	by div. 100 7 20,0 3 40,0	by div. 105 7 19,0 3 39,5	219,901
	983	Pos.	81·70 127·00 83·32 125·28	104·350 105·160 104·300	104·755 104·730	104·742	at div. 100 7 22 20 26 31 29 39,5	at div. 105 7 22 36 26 14,5 29 56	by div. 100 7 19,5 3 39,75	by div. 105 7 20,0 3 40,00	219,987
	984	Neg.	125·28 77·00 123·12 78·48	101·140 100·060 100·800	100·600 100·430	100·515	at div. 100 7 33 40 37 15,5 40 48,5	at div. 105 7 33 25,5 37 31 40 43	by div. 100 7 18,5 3 39,25	by div. 105 7 17,5 3 38,75	219,199
	985	Pos.	78·48 128·90 80·30 126·92	103·690 104·600 103·610	104·145 104·105	104·125	at div. 100 7 44 29 48 32 51 47	at div. 105 7 44 43 48 17,5 52 2	by div. 100 7 18,0 3 39,0	by div. 105 7 19,0 3 39,5	219,412
	986	Neg.	126·92 74·20 124·70 75·90	100·560 99·450 100·300	100·005 99·875	99·940	at div. 95 7 55 55 59 7 8 3 14	at div. 100 7 55 41,5 59 21 8 2 59,5	by div. 95 7 19,0 3 39,5	by div. 100 7 18,0 3 39,0	219,006
Continued.	987	Pos.	75·90 130·40 77·94 128·30	103·150 104·170 103·120	103·660 103·645	103·652	at div. 100 8 6 32 10 31 13 50,5	at div. 105 8 6 45 10 18 14 4,5	by div. 100 7 18,5 3 39,25	by div. 105 7 19,5 3 39,75	219,615

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1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T = 66·60 B = 30·030	988	Neg.	128·30 72·12 125·90 74·10	100·210 99·010 100·000	99·610 99·505	99·557	at div. 95 8 17 54 21 10 25 14	at div. 100 8 17 41 21 23 25 0	by div. 95 7 20,0 3 40,0	by div. 100 7 19,0 3 39,5	* 219,544
August 21 T = 69·30 B = 29·682	989	Pos.	88·50 113·74 89·32 112·90	101·120 101·530 101·110	101·325 101·320	101·322	at div. 101 6 17 3,5 missed. 24 27,5	at div. 102 6 17 9 missed. 24 34	by div. 101 7 24,0 3 42,0	by div. 102 7 25,0 3 42,5	222,162
	990	Neg.	112·90 82·00 111·80 82·74	97·450 96·900 97·270	97·175 97·085	97·130	at div. 97 6 28 16 missed. 35 39	at div. 98 6 28 11 missed. 35 34	by div. 97 7 23,0 3 41,5	by div. 98 7 23,0 3 41,5	221,500
	991	Pos.	82·74 118·58 83·96 117·50	100·660 101·270 100·730	100·965 101·000	100·982	at div. 100 6 39 21 43 11 46 45	at div. 105 6 39 41 42 50,5 47 6	by div. 100 7 24,0 3 42,0	by div. 105 7 25,0 3 42,5	222,098
	992	Neg.	117·50 77·00 115·90 78·00	97·250 96·450 96·950	96·850 96·700	96·775	at div. 95 6 50 41 54 10 58 4	at div. 100 6 50 23,5 54 28,5 57 46	by div. 95 7 23,0 3 41,50	by div. 100 7 22,5 3 41,25	221,411
	993	Pos.	78·00 122·40 79·40 120·92	100·200 100·900 100·160	100·550 100·530	100·540	at div. 100 7 1 42 5 27 9 6,5	at div. 105 7 1 58 5 11 9 23,5	by div. 100 7 24,5 3 42,25	by div. 105 7 25,5 3 42,75	222,304
	994	Neg.	120·92 72·70 119·20 74·00	96·810 95·950 96·600	96·380 96·275	96·327	at div. 95 7 12 56,5 16 31 20 20,5	at div. 100 7 12 42 16 46 20 5	by div. 95 7 24,0 3 42,0	by div. 100 7 23,0 3 41,5	221,867
	995	Pos.	74·00 125·40 75·60 123·80	99·700 100·500 99·700	100·100 100·100	100·100	at div. 100 7 24 1 27 44 31 26	at div. 105 7 24 15 27 29 31 41	by div. 100 7 25,0 3 42,5	by div. 105 7 26,0 3 43,0	222,510
	996	Neg.	123·80 69·10 121·88 70·60	96·450 95·490 96·240	95·970 95·865	95·917	at div. 95 7 35 13,5 38 50,5 42 37,5	at div. 100 7 35 0 39 4 42 23,5	by div. 95 7 24,0 3 42,00	by div. 100 7 23,5 3 41,75	221,954
	997	Pos.	70·60 127·88 72·34 126·00	99·240 100·110 99·170	99·675 99·640	99·657	at div. 95 7 46 8 50 14 53 32	at div. 100 7 46 20,5 50 1,5 53 45,5	by div. 95 7 24,0 3 42,0	by div. 100 7 25,0 3 42,5	222,466
	998	Neg.	126·00 66·08 123·90 67·70	96·040 94·990 95·800	95·515 95·395	95·455	at div. 95 7 57 30 8 1 10 4 54,5	at div. 100 7 57 18 8 1 22,5 4 41,5	by div. 95 7 24,5 3 42,25	by div. 100 7 23,5 3 41,75	222,205
Continued.	999	Pos.	67·70 129·88 69·54 127·90	98·790 99·710 98·720	99·250 99·215	99·232	at div. 95 8 8 28 12 30,5 15 52,5	at div. 100 8 8 39,5 12 18,5 16 4,5	by div. 95 7 24,5 3 42,25	by div. 100 7 25,0 3 42,50	222,462

20th SERIES cont.—2½-inch *Platina* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T = 69·40 B = 29·714	1000	Neg.	127·90 63·30 125·50 65·08	95·600 94·400 95·290	95·000 94·845	94·922	at div. 90 8 19 58 missed. 27 23,5	at div. 95 8 19 47,5 missed. 27 12	by div. 90 7 25,5 3 42,75	by div. 95 7 24,5 3 42,25	222,258
August 22 T = 66·93 B = 29·942	1001	Pos.	80·60 111·40 81·98 110·30	96·000 96·690 96·140	96·345 96·415	96·380	at div. 95 11 21 51 25 44,5 29 10	at div. 100 11 22 14 25 21 29 35	by div. 95 7 19,0 3 39,5	by div. 100 7 21,0 3 40,5	219,776
	1002	Neg.	110·30 75·28 108·72 76·50	92·790 92·000 92·610	92·395 92·305	92·350	at div. 90 11 33 10 36 30,5 40 31	at div. 95 11 32 50 36 51,5 40 9	by div. 90 7 21,0 3 40.5	by div. 95 7 19,0 3 39,5	220,030
	1003	Pos.	76·50 115·34 78·10 114·00	95·920 96·720 96·050	96·320 96·385	96·352	at div. 95 11 43 58,5 47 49 51 18,5	at div. 100 11 44 17 47 30 51 38,5	by div. 95 7 20,0 3 40,00	by div. 100 7 21,5 3 40,75	220,203
	1004	Neg.	114·00 71·70 112·32 73·02	92·850 92·010 92·670	92·430 92·340	92·385	at div. 90 11 55 15 58 39,5 0 2 36,5	at div. 95 11 54 59 58 56,5 0 2 19	by div. 90 7 21,5 3 40,75	by div. 95 7 20,0 3 40,00	220,392
	1005	Pos.	73·02 118·76 74·72 117·32	95·890 96·740 96·020	96·315 96·380	96·347	at div. 95 0 6 7 9 55 13 26,5	at div. 100 0 6 22,5 9 39 13 43	by div. 95 7 19,5 3 39,75	by div. 100 7 20,5 3 40,25	219,885
	1006	Neg.	117·32 68·20 115·52 69·70	92·760 91·860 92·610	92·310 92·235	92·272	at div. 90 0 17 20 20 47 24 40	at div. 95 0 17 6 21 1,5 24 25	by div. 90 7 20,0 3 40,0	by div. 95 7 19,0 3 39,5	219,773
	1007	Pos.	69·70 121·80 71·34 120·06	95·750 96·570 95·700	96·160 96·135	96·147	at div. 95 0 28 12,5 31 59 35 32,5	at div. 100 0 28 26 31 45 35 47	by div. 95 7 20,0 3 40,0	by div. 100 7 21,0 3 40,5	220,115
T = 67·18 B = 29·942	1008	Neg.	120·06 65·00 118·22 66·60	92·530 91·610 92·410	92·070 92·010	92·040	at div. 90 0 39 23,5 42 53 46 44	at div. 95 0 39 11 43 6 46 30,5	by div. 90 7 20,5 3 40,25	by div. 95 7 19,5 3 39,75	220,046
August 25 T = 62·30 B = 30·168	1009	Neg.	161·10 82·30 158·80 84·80	121·700 120·550 121·800	121·125 121·175	121·150	at div. 120 6 42 10 45 44 49 27,5	at div. 125 6 42 1 45 54 49 18	by div. 120 7 17,5 3 38,75	by div. 125 7 17,0 3 38,50	218,693
	1010	Pos.	84·80 164·10 87·50 161·72	124·450 125·800 124·610	125·125 125·205	125·165	at div. 125 6 53 5 56 44 7 0 23	at div. 130 6 53 14 56 35,5 7 0 32,5	by div. 125 7 18,0 3 39,00	by div. 130 7 18,5 3 39,25	219,008
Continued.	1011	Neg.	161·72 82·18 159·00 84·52	121·950 120·590 121·760	121·270 121·175	121·222	at div. 120 7 4 6 7 40,5 11 23,5	at div. 125 7 3 57 7 49,5 11 14	by div. 120 7 17,5 3 38,75	by div. 125 7 17,0 3 38,50	218,689

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	s
Continued.	1012	Pos.	84·52 164·34 87·30 161·92	124·430 125·820 124·610	125·125 125·215	125·170	at div. 125 7 15 1,5 18 41 22 19	at div. 130 7 15 10,5 18 32 22 28,5	by div. 125 7 17,5 3 38,75	by div. 130 7 18,0 3 39,00	218,758
	1013	Neg.	161·92 82·00 159·14 84·50	121·960 120·570 121·820	121·265 121·195	121·230	at div. 120 7 26 2 29 37 33 20	at div. 125 7 25 53,5 29 46 33 10,5	by div. 120 7 18,0 3 39,0	by div. 125 7 17,0 3 38,5	218,877
	1014	Pos.	84·50 164·42 87·30 161·94	124·460 125·860 124·620	125·160 125·240	125·200	at div. 125 7 36 58 40 37,5 44 16	at div. 130 7 37 7 40 28,5 44 25,5	by div. 125 7 18,0 3 39,00	by div. 130 7 18,5 3 39,25	219,010
	1015	Neg.	161·94 81·94 159·12 84·52	121·940 120·530 121·820	121·235 121·175	121·205	at div. 120 7 47 59 51 33,5 55 17	at div. 125 7 47 50 51 42,5 55 7,5	by div. 120 7 18,0 3 39,00	by div. 125 7 17,5 3 38,75	218,940
T=62·08 B=30·168	1016	Pos.	84·52 164·10 87·46 161·30	124·310 125·780 124·380	125·045 125·080	125·062	at div. 125 7 58 55,5 8 2 34 6 13	at div. 130 7 59 4 8 2 25 6 22,5	by div. 125 7 17,5 3 38,75	by div. 130 7 18,5 3 39,25	218,756
Aug. 26 T=62·48 B=30·284	1017	Pos.	93·30 114·92 94·22 114·32	104·110 104·570 104·270	104·340 104·420	104·380	at div. 100 9 43 32 48 15 50 56	at div. 105 9 44 6 47 40 51 32	by div. 100 7 24,0 3 42,0	by div. 105 7 26,0 3 43,0	222,876
	1018	Neg.	114·32 87·00 113·34 87·92	100·660 100·170 100·630	100·415 100·400	100·407	at div. 100 9 55 19 58 58 10 2 46	at div. 105 9 54 52 59 25 10 2 17	by div. 100 7 27,0 3 43,5	by div. 105 7 25,0 3 42,5	223,419
	1019	Pos.	87·92 120·42 89·16 119·44	104·170 104·790 104·300	104·480 104·545	104·512	at div. 100 10 6 11 10 35 13 36	at div. 105 10 6 33,5 10 12 14 0	by div. 100 7 25,0 3 42,50	by div. 105 7 26,5 3 43,25	223,177
	1020	Neg.	119·44 82·28 118·10 83·38	100·860 100·190 100·740	100·525 100·465	100·495	at div. 100 10 17 46 21 25,5 25 12	at div. 105 10 17 27 21 45,5 24 51,5	by div. 100 7 26,0 3 43,00	by div. 105 7 24,5 3 42,25	222,926
	1021	Pos.	83·38 124·80 84·80 123·50	104·090 104·800 104·150	104·445 104·475	104·460	at div. 100 10 28 42 32 56,5 36 6,5	at div. 105 10 28 59 32 38,5 36 25	by div. 100 7 24,5 3 42,25	by div. 105 7 26,0 3 43,00	222,919
	1022	Neg.	123·50 78·28 121·90 79·68	100·890 100·090 100·790	100·490 100·440	100·465	at div. 100 10 40 10,5 43 50,5 47 36	at div. 105 10 39 54,5 44 7 47 19	by div. 100 7 25,5 3 42,75	by div. 105 7 24,5 3 42,25	222,704
Continued.	1023	Pos.	79·68 128·32 81·40 126·76	104·000 104·860 104·080	104·430 104·470	104·450	at div. 100 10 51 7 55 16,5 58 31,5	at div. 105 10 51 21,5 55 1 58 47	by div. 100 7 24,5 3 42,25	by div. 105 7 25,5 3 42,75	222,695

20th SERIES cont.—1½-inch *Platina* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times. h m s	Observed Times. h m s	2 N m s	2 N m s	N for Mean Resting Point.
Continued. T=62·83 B=30·292	1024	Neg.	126·76 75·08 124·84 76·78	100·920 99·960 100·810	100·440 100·383	100·412	at div. 100 11 2 31,5 6 12 9 36,5	at div. 103 11 2 18 6 26 9 42	by div. 100 7 23,0 3 42,5	by div. 105 7 24,0 3 42,0	222,459

21st SERIES.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

Aug. 26 T=66·03 B=30·292	1025	Pos.	77·30 123·02 79·20 122·98	101·160 102·110 101·090	101·635 101·600	101·617	at div. 100 3 23 53 30 20 34 23	at div. 105 3 26 10 30 2,5 34 41,3	by div. 100 8 30,0 4 15,00	by div. 105 8 31,5 4 13,75	255,243
	1026	Neg.	122·98 70·50 120·52 72·30	96·740 93·310 96·410	96·123 95·960	96·042	at div. 93 3 38 50 42 37 47 18	at div. 100 3 38 34 43 14 47 1	by div. 93 8 28,0 4 14,0	by div. 100 8 27,0 4 13,5	253,896
	1027	Pos.	72·30 128·70 74·56 126·30	100·500 101·630 100·430	101·065 101·030	101·047	at div. 100 3 51 29,5 53 30 39 58	at div. 105 3 51 43,5 55 35 4 0 13,3	by div. 100 8 28,3 4 14,25	by div. 103 8 30,0 4 13,00	254,407
	1028	Neg.	126·30 66·00 123·66 68·08	96·130 94·830 93·870	93·490 95·350	95·420	at div. 93 4 4 18,5 8 30 12 46,5	at div. 100 4 4 4,3 8 44,5 12 31,5	by div. 95 8 28,0 4 14,0	by div. 100 8 27,0 4 13,5	253,938
	1029	Pos.	68·08 131·66 70·54 129·06	99·870 101·100 99·800	100·485 100·450	100·467	at div. 100 4 17 1,5 21 18 23 30	at div. 105 4 17 14,5 21 4,3 25 44	by div. 100 8 28,5 4 14,23	by div. 105 8 29,5 4 14,75	254,297
T=66·03 B=30·292	1030	Neg.	129·06 62·26 126·10 64·60	95·660 94·180 93·350	94·920 94·763	94·842	at div. 90 4 29 59 33 48,5 38 28	at div. 93 4 29 47 34 1,5 38 15	by div. 90 8 29,0 4 14,3	by div. 93 8 28,0 4 14,0	254,016
		About menced the which For I of the	2 hours the ex- results had oc had been torsion	after the periments would be curred sometime box, and	2-inch above affected during *within* where I	lead balls recorded, by the the time the frame had oc	had been for the express change of tem that some pre -work, making casion for the	screwed to the purpose of as perature and vious proceed sundry adjust introduction of	torsion rod, certaining other cir ings had ments in a lighted	I com- whether cumstances occupied. the interior candle.	
Aug. 27 T=68·70 B=30·280	1031	Pos.	71·52 137·60 74·50 134·68	104·560 106·030 104·590	105·305 103·320	105·312	at div. 103 4 22 36,5 26 53 31 6,5	at div. 110 4 22 49 26 40 31 20	by div. 105 8 30,0 4 15,0	by div. 110 8 31,0 4 15,5	255,031
	1032	Neg.	134·68 66·68 131·34 69·20	100·680 99·010 100·270	99·843 99·640	99·742	at div. 95 4 35 36,5 39 27,5 44 7	at div. 100 4 35 24 39 40,5 43 33,5	by div. 95 8 30,5 4 13,25	by div. 100 8 29,5 4 14,75	254,776
Continued.	1033	Pos.	69·20 138·70 72·40 133·58	103·930 105·550 103·990	104·730 104·770	104·760	at div. 100 4 48 0,5 52 38 56 29,5	at div. 103 4 48 12 32 26 56 42	by div. 100 8 29,0 4 14,5	by div. 105 8 30,0 4 13,0	254,976

21st SERIES continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1034	Neg.	135·58 64·74 132·12 67·70	100·160 98·430 99·910	99·295 99·170	99·232	at div. 95 5 1 8,5 5 3 9 38,5	at div. 100 5 0 57 5 15 9 26	by div. 95 8 30,0 4 15,0	by div. 100 8 29,0 4 14,5	254,577
T = 68·70 B = 30·280	1035	Pos.	67·70 139·40 70·94 136·10	103·550 105·170 103·520	104·360 104·345	104·352	at div. 100 5 13 35,5 18 11 22 4	at div. 105 5 13 47 17 59 22 17	by div. 100 8 28,5 4 14,25	by div. 105 8 30,0 4 15,00	254,903
August 28 T = 69·67 B = 30·280	1036	Pos.	62·00 147·28 64·80 144·78	104·640 106·040 104·790	105·340 105·415	105·377	at div. 105 11 47 25,5 51 40 55 51	at div. 110 11 47 35 51 30 56 1	by div. 105 8 25,5 4 12,75	by div. 110 8 26,0 4 13,00	252,769
	1037	Neg.	144·78 56·72 141·90 59·20	100·750 99·310 100·550	100·030 99·930	99·980	at div. 95 0 0 16,5 4 11 8 43	at div. 100 0 0 7 4 20 8 33	by div. 95 8 26,5 4 13,25	by div. 100 8 26,0 4 13,00	253,001
	1038	Pos.	59·20 149·74 61·96 147·12	104·470 105·850 104·540	105·160 105·195	105·177	at div. 105 0 12 48 17 2 21 14,5	at div. 110 0 12 57 16 52,5 21 24	by div. 105 8 26,5 4 13,25	by div. 110 8 27,0 4 13,50	253,259
	1039	Neg.	147·12 54·00 144·16 56·60	100·560 99·080 100·380	99·820 99·730	99·775	at div. 95 0 25 38,5 29 35 34 5,5	at div. 100 0 25 29,5 29 44 33 56	by div. 95 8 27,0 4 13,50	by div. 100 8 26,5 4 13,25	253,261
	1040	Pos.	56·60 151·88 59·42 149·08	104·240 105·650 104·250	104·945 104·950	104·947	at div. 100 0 38 3,5 42 34,5 46 30,5	at div. 105 0 38 12,5 42 26 46 40	by div. 100 8 27,0 4 13,50	by div. 105 8 27,5 4 13,75	253,747
	1041	Neg.	149·08 51·54 145·92 54·20	100·310 98·730 100·060	99·520 99·395	99·457	at div. 95 0 51 2,5 55 1 59 30,5	at div. 100 0 50 54 55 10 59 21,5	by div. 95 8 28,0 4 14,00	by div. 100 8 27,5 4 13,75	253,777
	1042	Pos.	54·20 153·52 57·20 150·40	103·860 105·360 103·800	104·610 104·580	104·595	at div. 100 1 3 30,5 8 0,5 11 58,5	at div. 105 1 3 39 7 52 12 7,5	by div. 100 8 28,0 4 14,00	by div. 105 8 28,5 4 14,25	254,230
	1043	Neg.	150·40 49·44 147·02 52·30	99·920 98·230 99·660	99·075 98·945	99·010	at div. 95 1 16 28,5 20 29,5 24 57	at div. 100 1 16 20,5 20 38 24 48,5	by div. 95 8 28,5 4 14,25	by div. 100 8 28,0 4 14,00	254,050
	1044	Pos.	52·30 154·44 55·50 151·20	103·370 104·970 103·350	104·170 104·160	104·165	at div. 100 1 28 59,5 33 27,5 37 28	at div. 105 1 29 7,5 33 19 37 36,5	by div. 100 8 28,5 4 14,25	by div. 105 8 29,0 4 14,50	254,458
Continued.	1045	Neg.	151·20 48·08 147·54 51·10	99·640 97·810 99·320	98·725 98·565	98·645	at div. 95 1 41 57 45 59,5 50 25,5	at div. 100 1 41 49 46 7,5 50 17	by div. 95 8 28,5 4 14,25	by div. 100 8 28,0 4 14,00	254,068

21st SERIES continued.—2-inch *Lead* balls, with *single* copper wire; diameter =·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=69·95 B=30·254	1046	Pos.	51·10 154·70 54·58 151·30	102·900 104·640 102·940	103·770 103·790	103·780	at div. 100 1 54 30 58 56 2 2 58	at div. 105 1 54 37,5 58 48 2 3 6	by div. 100 8 28,0 4 14,00	by div. 105 8 28,5 4 14,25	* 254,189
August 29 T=68·77 B=30·220	1047	Neg.	134·80 79·08 132·52 80·70	106·940 105·800 106·610	106·370 106·205	106·287	at div. 105 11 15 3 19 6,5 23 24,5	at div. 110 11 14 49 19 21,5 23 9	by div. 105 8 21,5 4 10,75	by div. 110 8 20,0 4 10,00	250,557
	1048	Pos.	80·70 140·76 82·70 138·52	110·730 111·730 110·610	111·230 111·170	111·200	at div. 110 11 27 31,5 31 50 35 55	at div. 115 11 27 45 31 36 36 9	by div. 110 8 23,5 4 11,75	by div. 115 8 24,0 4 12,00	251,810
	1049	Neg.	138·52 74·20 135·98 76·30	106·360 105·090 106·140	105·725 105·615	105·670	at div. 105 11 40 14 44 22 48 37	at div. 110 11 40 1 44 35,5 48 23,5	by div. 105 8 23,0 4 11,50	by div. 110 8 22,5 4 11,25	251,467
	1050	Pos.	76·30 143·90 78·60 141·52	110·100 111·250 110·060	110·675 110·655	110·665	at div. 110 11 52 48 57 0 0 1 12	at div. 115 11 53 0 56 46 0 1 25	by div. 110 8 24,0 4 12,0	by div. 115 8 25,0 4 12,5	252,066
	1051	Neg.	141·52 70·32 138·72 72·40	105·920 104·520 105·560	105·220 105·040	105·130	at div. 105 0 5 28,5 9 40 13 52,5	at div. 110 0 5 17 9 52 13 40	by div. 105 8 24,0 4 12,0	by div. 110 8 23,0 4 11,5	251,987
	1052	Pos.	72·40 146·72 74·76 144·32	109·560 110·740 109·540	110·150 110·140	110·145	at div. 110 0 18 6 22 19 26 31	at div. 115 0 18 17 22 8 26 42,5	by div. 110 8 25,0 4 12,50	by div. 115 8 25,5 4 12,75	252,507
	1053	Neg.	144·32 66·48 141·60 68·62	105·400 104·040 105·110	104·720 104·575	104·647	at div. 100 0 30 55,5 34 48 39 20,5	at div. 105 0 30 45 34 59 39 9	by div. 100 8 25,0 4 12,5	by div. 105 8 24,0 4 12,00	252,035
T=69·10 B=30·200	1054	Pos.	68·62 149·60 71·08 147·00	109·110 110·340 109·040	109·725 109·690	109·707	at div. 105 0 43 16 47 47,5 51 41,5	at div. 110 0 43 25,5 47 37 51 51,5	by div. 105 8 25,5 4 12,75	by div. 110 8 26,0 4 13,00	252,985
Sept. 1 T=67·67 B=30·050	1055	Pos.	68·30 126·72 70·80 124·62	97·510 98·760 97·710	98·135 98·235	98·185	at div. 95 5 39 4,5 43 32 47 22	at div. 100 5 39 18,5 43 18 47 37,5	by div 95 8 17,5 4 8,75	by div. 100 8 19,0 4 9,50	249,228
	1056	Neg.	124·62 62·58 122·32 64·80	93·600 92·450 93·560	93·025 93·005	93·015	at div. 90 5 51 53 55 47 6 0 13	at div. 95 5 51 40 56 0 59 59,5	by div. 90 8 20,0 4 10,00	by div. 95 8 19,5 4 9,75	249,849
Continued.	1057	Pos.	64·80 130·54 67·30 128·28	97·670 98·920 97·790	98·295 98·355	98·325	at div. 95 6 4 9,5 8 36 12 29	at div. 100 6 4 21,5 8 23,5 12 42	by div. 95 8 19,5 4 9,75	by div. 100 8 20,5 4 10,25	250,082

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1058	Neg.	128·28 59·26 125·70 61·92	93·770 92·480 93·810	93·125 93·145	93·135	at div. 90 6 16 58 20 53,5 25 20	at div. 95 6 16 46 21 5,5 25 7	by div. 90 8 22,0 4 11,0	by div. 95 8 21,0 4 10,5	• 250,687
	1059	Pos.	61·92 133·40 64·90 130·44	97·660 99·150 97·670	98·405 98·410	98·407	at div. 95 6 29 17 33 44 37 38,5	at div. 100 6 29 28,5 33 32 37 50,5	by div. 95 8 21,5 4 10,75	by div. 100 8 21,0 4 11,00	250,920
	1060	Neg.	130·44 57·20 127·08 59·90	93·820 92·140 93·490	92·980 92·815	92·897	at div. 90 6 42 7 46 4,5 50 29	at div. 95 6 41 56 46 16 50 17	by div. 90 8 22,0 4 11,0	by div. 95 8 21,0 4 10,5	250,710
	1061	Pos.	59·90 134·48 62·90 131·40	97·190 98·690 97·150	97·940 97·920	97·930	at div. 95 6 54 29,5 58 54 7 2 52	at div. 100 6 54 40 58 43 7 3 3,5	by div. 95 8 22,5 4 11,25	by div. 100 8 23,5 4 11,75	251,543
	1062	Neg.	131·40 55·30 127·90 58·10	93·350 91·600 93·000	92·475 92·300	92·387	at div. 90 7 7 17,5 11 18 15 40	at div. 95 7 7 7 11 29 15 28,5	by div. 90 8 22,5 4 11,25	by div. 95 8 21,5 4 10,75	251,011
	1063	Pos.	58·10 135·18 61·30 132·00	96·640 98·240 96·650	97·440 97·445	97·442	at div. 95 7 19 43,5 24 5 28 6	at div. 100 7 19 54 23 54,5 28 17,5	by div. 95 8 22,5 4 11,15	by div. 100 8 23,5 4 11,75	251,494
	1064	Neg.	132·00 53·72 128·48 56·70	92·860 91·100 92·590	91·980 91·845	91·912	at div. 90 7 32 29 36 32,5 40 52	at div. 95 7 32 19 36 43 40 41	by div. 90 8 23,0 4 11,5	by div. 95 8 22,0 4 11,0	251,309
	1065	Pos.	56·70 135·70 59·90 132·50	96·200 97·800 96·200	97·000 97·000	97·000	at div. 95 7 44 57 49 17 53 19,5	at div. 100 7 45 7 49 6 53 30,5	by div. 95 8 22,5 4 11,25	by div. 100 8 23,5 4 11,75	251,450
T=67·11 B=30·080	1066	Neg.	132·50 52·52 129·00 55·60	92·510 90·760 92·300	91·635 91·530	91·582	at div. 90 7 57 41 8 1 46 6 4	at div. 95 7 57 31 8 1 56 5 53	by div. 90 8 23,0 4 11,5	by div. 95 8 22,0 4 11,0	251,342

22nd SERIES.—2½-inch hollow *Brass* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
Sept. 3 T=62·91 B=29·770	1067	Pos.	92·00 111·72 92·80 111·00	101·860 102·260 101·900	102·060 102·080	102·070	at div. 100 7 21 26 25 31 28 37	at div. 105 7 22 1 24 48 29 15	by div. 100 7 11,0 3 35,5	by div. 105 7 14,0 3 37,0	216,121
Continued.	1068	Neg.	111·00 86·10 109·92 86·80	98·550 98·010 98·360	98·280 98·185	98·232	at div. 95 7 32 53 35 50 40 6	al div. 100 7 32 24,5 36 21 39 35	by div. 95 7 13,0 3 36,50	by div. 100 7 10,5 3 35,25	215,692

22nd SERIES cont.—2½-inch hollow *Brass* balls, with *single* copper wire ; diam. = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1069	Pos.	86·80 116·30 88·40 115·26	101·550 102·350 101·830	101·950 102·090	102·020	at div. 100 7 43 20 47 13 50 30	at div. 105 7 43 42,5 46 49 50 55,5	by div. 100 7 10,0 3 35,0	by div. 105 7 13,0 3 36,5	* 215,606
	1070	Neg.	115·26 82·00 113·60 83·48	98·630 97·800 98·540	98·215 98·170	98·192	at div. 95 7 54 38 57 45 8 1 51	at div. 100 7 54 16,5 58 8 8 1 28	by div. 95 7 13,0 3 36,50	by div. 100 7 11,5 3 35,75	216,021
	1071	Pos.	83·48 119·82 85·06 118·50	101·650 102·440 101·780	102·045 102·110	102·077	at div. 100 8 5 8,5 9 1 12 21	at div. 105 8 5 27,5 8 41 12 42	by div. 100 7 12,5 3 36,25	by div. 105 7 14,5 3 37,25	216,665
T= B=	1072	Neg.	118·50 78·80 116·72 80·20	98·650 97·760 98·460	98·205 98·110	98·157	at div. 95 8 16 21,5 19 35 23 35,5	at div. 100 8 16 3,5 19 54,5 23 16,5	by div. 95 7 14,0 3 37,0	by div. 100 7 13,0 3 36,5	216,684
Sept. 26 T=60·03 B=29·500	1073	Pos.	89·54 112·10 90·36 111·20	100·820 101·230 100·780	101·025 101·005	101·015	at div. 100 10 54 28 58 18 11 1 41	at div. 105 10 54 59 missed. 11 2 14	by div. 100 7 13,0 3 36,5	by div. 105 7 15,0 3 37,5	216,703
	1074	Neg.	111·20 83·70 110·08 84·34	97·450 96·890 97·210	97·170 97·050	97·110	at div. 95 11 5 43,5 8 58 12 57	at div. 100 11 5 18 9 25 12 30	by div. 95 7 13,5 3 36,75	by div. 100 7 12,0 3 36,00	216,434
	1075	Pos.	84·34 116·60 85·10 115·68	100·470 100·850 100·390	100·660 100·620	100·640	at div. 100 11 16 23 20 6 23 37,5	at div. 105 11 16 45 19 44 24 1	by div. 100 7 14,5 3 37,25	by div. 105 7 16,0 3 38,00	217,346
	1076	Neg.	115·68 78·40 114·54 79·10	97·040 96·470 96·820	96·755 96·645	96·700	at div. 95 11 27 27,5 30 51,5 34 41,5	at div. 100 11 27 9 31 11 34 22	by div. 95 7 14,0 3 37,0	by div. 100 7 13,0 3 36,5	216,835
	1077	Pos.	79·10 121·00 80·20 120·24	100·050 100·600 100·220	100·325 100·410	100·367	at div. 100 11 38 14,5 41 54,5 45 29	at div. 105 11 38 31 41 37,5 45 46	by div. 100 7 14,5 3 37,25	by div. 105 7 15,0 3 37,50	217,268
	1078	Neg.	120·24 73·60 118·98 74·88	96·920 96·290 96·930	96·605 96·610	96·607	at div. 95 11 49 16 52 44 56 32	at div. 100 11 49 1 52 59 56 16	by div. 95 7 16,0 3 38,0	by div. 100 7 15,0 3 37,5	217,840
	1079	Pos.	74·88 125·52 76·92 124·50	100·200 101·220 100·710	100·710 100·965	100·837	at div. 100 0 0 6 3 49,5 7 24	at div. 105 0 0 20 3 34 7 24	by div. 100 7 18,0 3 39,0	by div. 105 7 19,0 3 39,5	219,084
Continued.	1080	Neg.	124·50 71·10 122·68 73·08	97·800 96·890 97·880	97·345 97·385	97·365	at div. 95 0 11 16 14 44,5 18 38,5	at div. 100 0 11 3 14 58 18 24,5	by div. 95 7 22,5 3 41,25	by div. 100 7 21,5 3 40,75	221,014

22nd SERIES cont.—2½-inch hollow *Brass* balls, with *single* copper wire ; diam. = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=60·23 B=29·500	1081	Pos.	73·08 128·52 75·44 126·48	100·800 101·980 100·960	101·390 101·470	101·430	at div. 100 0 22 12 26 1 29 34,5	at div. 105 0 22 24,5 25 47,5 29 48	by div. 100 7 22,5 3 41,25	by div. 105 7 23,5 3 41,75	s 221,393
Sept. 27 T=60·01 B=29·500	1082	Pos.	91·20 114·38 92·16 113·62	102·790 103·270 102·890	103·030 103·080	103·055	at div. 100 6 47 23 51 37 54 34	at div. 105 6 47 53 51 5 55 6	by div. 100 7 11,0 3 35,5	by div. 105 7 13,0 3 36,5	216,111
	1083	Neg.	113·62 85·60 112·46 86·20	99·610 99·030 99·330	99·320 99·180	99·250	at div. 95 6 58 56,5 7 1 49 6 10,5	at div. 100 6 58 31 7 2 15 5 43	by div. 95 7 14,0 3 37,0	by div. 100 7 12,0 3 36,0	216,150
	1084	Pos.	86·20 118·74 87·98 117·70	102·470 103·360 102·840	102·915 103·100	103·007	at div. 100 7 9 16,5 13 19 16 27,5	at div. 105 7 9 38 12 57 16 51	by div. 100 7 11,0 3 35,5	by div. 105 7 13,0 3 36,5	216,111
	1085	Neg.	117·70 81·62 116·28 82·72	99·660 98·950 99·500	99·305 99·225	99·265	at div. 95 7 20 38 23 40 27 51,5	at div. 100 7 20 18,5 24 0,5 27 30,5	by div. 95 7 13,5 3 36,75	by div. 100 7 12,0 3 36,00	216,110
	1086	Pos.	82·72 122·34 84·18 121·10	102·530 103·260 102·640	102·895 102·950	102·922	at div. 100 7 31 3,5 35 1 38 15,5	at div. 105 7 31 21 34 43 38 34	by div. 100 7 12,0 3 36,0	by div. 105 7 13,0 3 36,5	216,292
	1087	Neg.	121·10 77·90 119·42 79·10	99·500 98·660 99·260	99·080 98·960	99·020	at div. 95 7 42 19 45 29 49 32	at div. 100 7 42 3 45 45 49 15	by div. 95 7 13,0 3 36,5	by div. 100 7 12,0 3 36,0	216,098
	1088	Pos.	79·10 125·30 80·58 123·90	102·200 102·940 102·240	102·570 102·590	102·580	at div. 100 7 52 50 56 43 8 0 3	at div. 105 7 53 5 56 27 8 0 19	by div. 100 7 13,0 3 36,5	by div. 105 7 14,0 3 37,0	216,758
	1089	Neg.	123·90 74·40 122·08 75·60	99·150 98·240 98·840	98·695 98·540	98·617	at div. 95 8 4 1,5 7 17 11 14,5	at div. 100 8 3 47 7 31,5 10 59,5	by div. 95 7 13,0 3 36,50	by div. 100 7 12,5 3 36,25	216,319
	1090	Pos.	75·60 127·84 77·08 126·46	101·720 102·460 101·770	102·090 102·115	102·102	at div. 100 8 14 38,5 18 27 21 52	at div. 105 8 14 52 18 13,5 22 6,5	by div. 100 7 13,5 3 36,75	by div. 105 7 14,5 3 37,25	216,960
T=60·03 B=29·644	1091	Neg.	126·46 70·72 124·94 71·80	98·590 97·830 98·370	98·210 98·100	98·155	at div. 95 8 25 45 29 6 32 59	at div. 100 8 25 32,5 29 19 32 46	by div. 95 7 14,0 3 37,00	by div. 100 7 13,5 3 36,75	216,842
Sept. 28 T=60·93 B=29·400	1092	Pos.	88·92 120·42 90·18 119·50	104·670 105·300 104·840	104·985 105·070	105·027	at div. 105 6 39 28 43 10 46 51,5	at div. 110 6 39 51 42 48 47 16	by div. 105 7 23,5 3 41,75	by div. 110 7 25,0 3 42,50	221,754

22nd Series cont.—2½-inch hollow *Brass* balls, with *single* copper wire; diam. = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1093	Neg.	119·50 83·30 118·28 84·30	101·400 100·790 101·290	101·095 101·040	101·067	at div. 100 6 50 42 54 15,5 58 6	at div. 105 6 50 22 54 36 57 44,5	by div. 100 7 24,0 3 42,00	by div. 105 7 22,5 3 41,25	* 221,838
	1094	Pos.	84·30 124·82 85·84 123·70	104·560 105·330 104·770	104·945 105·050	104·997	at div. 100 7 1 31 5 49 8 53,5	at div. 105 7 1 48 5 30,5 9 12	by div. 100 7 22,5 3 41,25	by div. 105 7 24,0 3 42,00	222,000
	1095	Neg.	123·70 79·40 122·06 80·70	101·550 100·730 101·380	101·140 101·055	101·097	at div. 100 7 13 2 16 38 20 27,5	at div. 105 7 12 46,5 16 54,5 20 10,5	by div. 100 7 25,5 3 42,75	by div. 105 7 24,0 3 42,00	222,585
	1096	Pos.	80·70 128·52 82·34 127·06	104·610 105·430 104·700	105·020 105·065	105·042	at div. 105 7 24 8,5 27 51,5 31 33,5	at div. 110 7 24 23,5 27 36 31 49,5	by div. 105 7 25,0 3 42,50	by div. 110 7 26,0 3 43,00	222,504
	1097	Neg.	127·06 76·10 125·20 77·80	101·580 100·650 101·500	101·115 101·075	101·095	at div. 100 7 35 22 38 59 42 48	at div. 105 7 35 8,5 39 13,5 42 33	by div. 100 7 26,0 3 43,00	by div. 105 7 24,5 3 42,25	222,835
	1098	Pos.	77·80 131·48 79·88 129·74	104·640 105·680 104·810	105·160 105·245	105·202	at div. 105 7 46 29 50 12,5 53 53,5	at div. 110 7 46 42,5 49 59 54 8	by div. 105 7 24,5 3 42,25	by div. 110 7 25,5 3 42,75	222,270
	1099	Neg.	129·74 73·80 127·80 75·80	101·770 100·800 101·800	101·285 101·300	101·292	at div. 100 7 57 41,5 8 1 17 5 6	at div. 105 7 57 29 8 1 30,5 4 52,5	by div. 100 7 24,5 3 42,25	by div. 105 7 23,5 3 41,75	222,121
	1100	Pos.	75·80 133·64 77·94 131·70	104·720 105·790 104·820	105·255 105·305	105·280	at div. 105 8 8 47 12 30,5 16 11	at div. 110 8 8 59 12 17,5 16 24	by div. 105 7 24,0 3 42,0	by div. 110 7 25,0 3 42,5	222,028
T = 61·00 B = 29·420	1101	Neg.	131·70 72·36 128·12 74·50	102·030 100·240 101·310	101·135 100·775	100·955	at div. 100 8 20 0,5 23 36,5 27 25	at div. 105 8 19 48,5 23 49 27 12	by div. 100 7 24,5 3 42,25	by div. 105 7 23,5 3 41,75	222,155
Sept. 29 T = 62·13 B = 29·190	1102	Neg.	116·90 89·40 115·84 90·38	103·150 102·620 103·110	102·885 102·865	102·875	at div. 100 6 24 9 27 22 31 37	at div. 105 6 23 43 27 48,5 31 9	by div. 100 7 28,0 3 44,0	by div. 105 7 26,0 3 43,0	223,425
	1103	Pos.	90·38 122·68 91·80 121·70	106·530 107·240 106·750	106·885 106·995	106·940	at div. 105 6 34 59,5 38 59 42 25	at div. 110 6 35 21,5 38 36 40 48,5	by div. 105 7 25,5 3 42,75	by div. 110 7 27,0 3 43,50	223,041
Continued.	1104	Neg.	121·70 85·20 120·22 86·68	103·450 102·710 103·450	103·080 103·080	103·080	at div. 100 6 46 32 49 51 54 0	at div. 105 6 46 12 50 11,5 53 38,5	by div. 100 7 28,0 3 44,00	by div. 105 7 26,5 3 43,25	223,538

22nd SERIES cont.—2½-inch hollow *Brass* balls, with *single* copper wire; diam. = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1105	Pos.	86·68 126·82 88·30 125·40	106·750 107·560 106·850	107·155 107·205	107·180	at div. 105 6 57 25 7 1 24,5 4 51	at div. 110 6 57 43 7 1 6 5 10	by div. 105 7 26,0 3 43,0	by div. 110 7 27,0 3 43,5	• 223,218
	1106	Neg.	125·40 81·90 123·78 83·50	103·650 102·840 103·640	103·245 103·240	103·242	at div. 100 7 8 57 12 18,5 16 25	at div. 105 7 8 40,5 12 36 16 7	by div. 100 7 28,0 3 44,00	by div. 105 7 26,5 3 43,25	223,514
	1107	Pos.	83·50 130·08 85·40 128·48	106·790 107·740 106·940	107·265 107·340	107·302	at div. 105 7 19 52 23 50 27 18	at div. 110 7 20 7,5 23 34 27 34,5	by div. 105 7 26,0 3 43,0	by div. 110 7 27,0 3 43,5	223,230
	1108	Neg.	128·48 79·26 126·60 81·10	103·870 102·930 103·850	103·400 103·390	103·395	at div. 100 7 31 21 34 44 38 47,5	at div. 105 7 31 6,5 34 59 38 32	by div. 100 7 26,5 3 43,25	by div. 105 7 25,5 3 42,75	222,911
	1109	Pos.	81·10 132·70 83·24 130·96	106·900 107·970 107·100	107·435 107·535	107·485	at div. 105 7 42 16 46 12,5 49 40,5	at div. 110 7 42 29,5 45 58 49 55	by div. 105 7 24,5 3 42,25	by div. 110 7 25,5 3 42,75	222,498
	1110	Neg.	130·96 77·28 129·02 79·30	104·120 103·150 104·160	103·635 103·655	103·645	at div. 100 7 53 42,5 57 6 8 1 8,5	at div. 105 7 53 29 57 10 8 0 4,5	by div. 100 7 26,0 3 43,00	by div. 105 7 25,5 3 42,75	222,818
	1111	Pos.	79·30 134·98 81·66 132·94	107·140 108·320 107·300	107·730 107·810	107·770	at div. 105 8 4 36,5 8 33,5 12 1,5	at div. 110 8 4 49 8 20 12 15	by div. 105 7 25,0 3 42,5	by div. 110 7 26,0 3 43,0	222,777
T = 62·28 B = 29·240	1112	Neg.	132·94 75·92 130·60 78·28	104·430 103·260 104·440	103·845 103·850	103·847	at div. 100 8 16 4 19 28 23 31,5	at div. 105 8 15 51,5 19 41 23 18	by div. 100 7 27,5 3 43,75	by div. 105 7 26,5 3 43,25	223,365

23rd SERIES.—1½-inch *Platina* balls, with bifilar *silk* lines; distance = ·367 inch.

Oct. 11 T = 55·50 B = 29·570	1113	Pos.	90·48 112·74 91·32 112·00	101·610 102·030 101·660	101·820 101·845	101·832	at div. 100 6 10 22 missed. 18 25	at div. 102 6 10 37 missed. 18 40,5	by div. 100 8 3,0 4 1,50	by div. 102 8 3,5 4 1,75	241,729
	1114	Neg.	112·00 82·74 111·08 83·68	97·370 96·910 97·380	97·140 97·145	97·142	at div. 96 6 22 52,5 26 42 30 56,5	at div. 98 6 22 42,5 26 53 30 45,5	by div. 96 8 4,0 4 2,0	by div. 98 8 3,0 4 1,5	241,715
Continued.	1115	Pos.	83·68 119·32 84·90 118·24	101·500 102·110 101·570	101·805 101·840	101·822	at div. 100 6 34 48,5 39. 6,5 42 51,5	at div. 105 6 35 10,5 38 44,5 43 15	by div. 100 8 3,0 4 1,50	by div. 105 8 4,5 4 2,25	241,773

23rd SERIES continued.—1½-inch *Platina* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1116	Neg.	118·24 76·78 116·88 78·10	97·510 96·830 97·490	97·170 97·160	97·165	at div. 95 6 47 13 50 59 55 17	at div. 100 6 46 54,5 51 18 54 57,5	by div. 95 8 4,0 4 2,0	by div. 100 8 3,0 4 1,5	241,784
	1117	Pos.	78·10 124·70 79·72 123·24	101·400 102·210 101·480	101·805 101·845	101·825	at div. 100 6 59 8 7 3 22 7 11	at div. 105 6 59 24,5 7 3 5 7 29	by div. 100 8 3,0 4 1,50	by div. 105 8 4,5 4 2,25	241,774
	1118	Neg.	123·24 72·00 121·42 73·80	97·620 96·710 97·610	97·165 97·160	97·162	at div. 95 7 11 29 15 18 19 34	at div. 100 7 11 14 15 34 19 18	by div. 95 8 5,0 4 2,5	by div. 100 8 4,0 4 2,0	242,284
	1119	Pos.	73·80 129·00 75·80 127·18	101·400 102·400 101·490	101·900 101·945	101·922	at div. 100 7 23 26 27 40,5 31 30	at div. 105 7 23 40 27 25,5 31 45	by div. 100 8 4,0 4 2,0	by div. 105 8 5,0 4 2,5	242,192
	1120	Neg.	127·18 68·38 125·04 70·38	97·780 96·710 97·710	97·245 97·210	97·227	at div. 95 7 35 46 39 36,5 43 51	at div. 100 7 35 33 39 51 43 36,5	by div. 95 8 5,0 4 2,50	by div. 100 8 3,5 4 1,75	242,166
	1121	Pos.	70·38 132·40 72·60 130·32	101·390 102·500 101·460	101·945 101·980	101·962	at div. 100 7 47 44 51 56 55 47,5	at div. 105 7 47 56,5 51 43 56 1	by div. 100 8 3,5 4 1,75	by div. 105 8 4,5 4 2,25	241,946
	1122	Neg.	130·32 65·42 128·00 67·66	97·870 96·710 97·830	97·290 97·270	97·280	at div. 95 8 0 2 3 53,5 8 6,5	at div. 100 7 59 50,5 8 4 6 7 54	by div. 95 8 4,5 4 2,25	by div. 100 8 3,5 4 1,75	242,022
	1123	Pos.	67·66 135·12 70·02 132·82	101·390 102·570 101·420	101·980 101·995	101·987	at div. 100 8 12 0,5 16 12 20 4	at div. 105 8 12 12 16 0 20 16,5	by div. 100 8 3,5 4 1,75	by div. 105 8 4,5 4 2,25	241,949
T = 55·97 B = 29·650	1124	Neg.	132·82 63·12 130·32 65·48	97·970 96·720 97·900	97·345 97·310	97·327	at div. 95 8 24 18,5 28 20 32 22,5	at div. 100 8 24 7,5 28 21 32 10,5	by div. 95 8 4,0 4 2,0	by div. 100 8 3,0 4 1,5	241,767
Oct. 12 T = 55·87 B = 29·260	1125	Pos.	88·34 114·22 88·98 113·56	101·280 101·600 101·270	101·440 101·435	101·437	at div. 100 9 47 58 52 12 55 51	at div. 105 9 48 27,5 51 43 56 22	by div. 100 7 53,0 3 56,50	by div. 105 7 54,5 3 57,25	236,716
	1126	Neg.	113·56 80·70 112·66 81·50	97·130 96·680 97·080	96·905 96·880	96·892	at div. 95 10 0 10 3 49 8 4	at div. 100 9 59 47 10 4 12,5 7 39,5	by div. 95 7 54,0 3 57,00	by div. 100 7 52,5 3 56,25	236,716
Continued.	1127	Pos.	81·50 120·80 82·50 119·90	101·150 101·650 101·200	101·400 101·425	101·412	at div. 100 10 11 49 15 57 19 42,5	at div. 105 10 12 8,5 15 37,5 20 3	by div. 100 7 53,5 3 56,75	by div. 105 7 54,5 3 57,25	236,891

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1128	Neg.	119·90 74·50 118·80 75·46	97·200 96·650 97·130	96·925 96·890	96·907	at div. 95 10 23 54,5 27 38,5 31 48	at div. 100 10 23 38 27 55,5 31 30,5	by div. 95 7 53,5 3 56,75	by div. 100 7 52,5 3 56,25	s 236,559
	1129	Pos.	75·46 126·60 76·42 125·60	101·030 101·510 101·010	101·270 101·260	101·265	at div. 100 10 35 37 39 41 43 29,5	at div. 105 10 35 51,5 39 26 43 44,5	by div. 100 7 52,5 3 56,25	by div. 105 7 53,0 3 56,50	236,313
	1130	Neg.	125·60 68·40 124·50 69·40	97·000 96·450 96·950	96·725 96·700	96·712	at div. 95 10 47 36 51 22,5 55 28	at div. 100 10 47 22,5 51 36 55 14	by div. 95 7 52,0 3 56.00	by div. 100 7 51,5 3 55,75	235,914
	1131	Pos.	69·40 132·58 70·50 131·40	100·990 101·540 100·950	101·265 101·245	101·255	at div. 100 10 59 18 11 3 19,5 7 9,5	at div. 105 10 59 30 11 3 7 7 22	by div. 100 7 51,5 3 55,75	by div. 105 7 52,0 3 56,00	235,813
	1132	Neg.	131·40 63·12 129·86 64·68	97·260 96·490 97·270	96·875 96·880	96·877	at div. 95 11 11 15,5 15 4 19 9	at div. 100 11 11 4,5 15 15 18 57,5	by div. 95 7 53,5 3 56,75	by div. 100 7 53,0 3 56,50	236,656
	1133	Pos.	64·68 137·48 66·74 136·10	101·080 102·110 101·420	101·595 101·765	101·680	at div. 100 11 23 1 27 5,5 30 56,5	at div. 105 11 23 11,5 26 55 31 7,5	by div. 100 7 55,5 3 57,75	by div. 105 7 56,0 3 58,00	237,834
	1134	Neg.	136·10 59·74 134·58 61·80	97·920 97·160 98·190	97·540 97·675	97·607	at div. 95 11 35 5,5 38 54 43 4,5	at div. 100 11 34 55,5 39 4,5 42 54	by div. 95 7 59,0 3 59,50	by div. 100 7 58,5 3 59,25	239,370
	1135	Pos.	61·80 142·20 64·00 140·58	102·000 103·100 102·290	102·550 102·695	102·622	at div. 100 11 46 54,5 51 3 54 52	at div. 105 11 47 4 50 53,5 55 2	by div. 100 7 57,5 3 58,75	by div. 105 7 58,0 3 59,00	238,881
	1136	Neg.	140·58 56·82 138·78 58·82	98·700 97·800 98·800	98·250 98·300	98·275	at div. 95 11 59 3,5 0 2 51 7 2	at div. 100 11 58 54 0 3 0 6 52,5	by div. 95 7 58,5 3 59,25	by div. 100 7 58,5 3 59,25	239,250
	1137	Pos.	58·82 146·12 60·90 144·30	102·470 103·510 102·600	102·990 103·055	103·022	at div. 100 0 10 52 15 2 18 50	at div. 105 0 11 0,5 14 53 19 59	by div. 100 7 58,0 3 59,00	by div. 105 7 58,5 3 59,25	239,151
	1138	Neg.	144·30 53·60 142·18 55·60	98·950 97·890 98·890	98·420 98·390	98·405	at div. 95 0 23 2 26 50 31 2	at div. 100 0 22 54 26 59 30 53	by div. 95 8 0,0 4 0,0	by div. 100 7 59,0 3 59,5	239,660
Continued.	1139	Pos.	55·60 149·20 57·80 147·00	102·400 103·500 102·400	102·950 102·950	102·950	at div. 100 0 34 52 39 2,5 42 52,5	at div. 105 0 35 0,5 38 54 43 1	by div. 100 8 0,5 4 0,25	by div. 105 8 0,5 4 0,25	240,250

23rd SERIES continued.—1½-inch *Platina* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T = 56·27 B = 29·270	1140	Neg.	147·00 50·70 144·50 53·10	98·850 97·600 98·800	98·225 98·200	98·212	at div. 95 0 47 4 50 54 55 5	at div. 100 0 46 56 51 2,5 54 57	by div. 95 8 1,0 4 0,5	by div. 100 8 1,0 4 0,5	s 240,500
Oct. 13 T = 54·13 B = 29·972	1141	Pos.	68·72 138·26 71·10 135·98	103·490 104·680 103·540	104·085 104·110	104·097	at div. 100 10 47 18,5 51 32,5 55 10	at div. 105 10 47 29,5 51 21 55 22	by div. 100 7 51,5 3 55,75	by div. 105 7 52,5 3 56,25	236,160
	1142	Neg.	135·98 64·50 133·56 66·80	100·240 99·030 100·180	99·635 99·605	99·620	at div. 95 10 59 27,5 11 3 4 7 20,5	at div. 100 10 59 17 11 3 14,5 7 9	by div. 95 7 53,0 3 56,5	by div. 100 7 52,0 3 56,0	236,038
	1143	Pos.	66·80 140·36 69·28 138·28	103·580 104·820 103·780	104·200 104·300	104·250	at div. 100 11 10 59 15 12,5 18 50,5	at div. 105 11 11 9,5 15 2 19 1,5	by div. 100 7 51,5 3 55,75	by div. 105 7 52,0 3 56,00	235,962
	1144	Neg.	138·28 62·50 136·36 64·40	100·390 99·430 100·380	99·910 99·905	99·907	at div. 95 11 23 7 26 43 31 59,5	at div. 100 11 22 57 26 53,5 30 49	by div. 95 7 52,5 3 56,25	by div. 100 7 52,0 3 56,00	236,005
	1145	Pos.	64·40 143·72 66·38 142·20	104·060 105·050 104·290	104·555 104·670	104·612	at div. 100 11 34 38 38 51 42 28,5	at div. 105 11 34 47,5 38 41,5 42 38,5	by div. 100 7 50,5 3 55,25	by div. 105 7 51,0 3 55,50	235,481
	1146	Neg.	142·20 59·38 140·70 61·16	100·790 100·040 100·930	100·415 100·485	100·450	at div. 100 11 46 35,5 50 29 54 27	at div. 105 11 46 26,5 50 39 54 17,5	by div. 100 7 51,5 3 55,75	by div. 105 7 51,0 3 55,50	235,728
	1147	Pos.	61·16 148·40 62·74 146·98	104·780 105·570 104·860	105·175 105·215	105·195	at div. 105 11 58 22,5 0 2 18 6 12	at div. 110 11 58 31 0 2 9,5 6 21	by div. 105 7 49,5 3 54,75	by div. 110 7 50,0 3 55,00	234,760
	1148	Neg.	146·98 55·90 145·26 58·56	101·440 100·580 101·910	101·010 101·245	101·127	at div. 100 0 10 11 14 3 18 4	at div. 105 0 10 2,5 14 11,5 17 55	by div. 100 7 53,0 3 56,50	by div. 105 7 52,5 3 56,25	236,444
	1149	Pos.	58·56 151·30 61·70 148·62	104·930 106·500 105·160	105·715 105·830	105·772	at div. 105 0 22 0 26 0 29 55	at div. 110 0 22 8,5 25 52 30 4	by div. 105 7 55,0 3 57,50	by div. 110 7 55,5 3 57,75	237,539
T = 54·28 B = 30·000	1150	Neg.	148·62 55·08 146·02 57·10	101·850 100·550 101·560	101·200 101·055	101·127	at div. 100 0 33 57,5 37 50,5 41 51,5	at div. 105 0 33 49 37 59 41 43	by div. 100 7 54,0 3 57,0	by div. 105 7 54,0 3 57,0	237,000
Oct. 14 T = 55·71 B = 29·850 Continued.	1151	Pos.	83·26 117·80 84·68 116·60	100·530 101·240 100·640	100·885 100·940	100·912	at div. 100 2 51 36,5 55 46 59 39,5	at div. 105 2 51 59 55 23 3 0 3,5	by div. 100 8 3,0 4 1,50	by div. 105 8 4,5 4 2,25	241,637

23rd Series continued.—1½-inch *Platina* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1132	Neg.	116·60 76·78 115·18 78·30	96·690 93·980 96·740	96·335 96·360	96·347	at div. 95 3 3 33 7 44,5 11 57	at div. 100 3 3 34 8 5 11 36	by div. 93 8 4,0 4 2,0	by div. 100 8 2,0 4 1,0	s 241,731
	1153	Pos.	78·30 123·00 80·16 121·46	100·650 101·380 100·810	101·115 101·193	101·155	at div. 100 3 15 33 20 2,3 23 33,3	at div. 105 3 16 10 19 44,5 24 14	by div. 100 8 2,3 4 1,25	by div. 105 8 4,0 4 2,00	241,423
	1154	Neg.	121·46 72·60 119·56 74·40	97·030 96·080 96·980	96·555 96·540	96·347	at div. 95 3 28 9 32 0,5 36 12,5	at div. 100 3 27 53 32 17 35 35	by div. 95 8 3,5 4 1,73	by div. 100 8 2,0 4 1,00	241,518
	1155	Pos.	74·40 127·00 76·54 123·10	100·700 101·770 100·820	101·235 101·293	101·263	at div. 100 3 40 8 44 17,5 48 10,5	at div. 105 3 40 23 44 2 48 26,5	by div. 100 8 2,5 4 1,23	by div. 105 8 3,5 4 1,75	241,376
	1136	Neg.	125·10 69·28 123·00 71·32	97·190 96·140 97·160	96·665 96·650	96·657	at div. 95 3 32 23 56 15 4 0 26	at div. 100 3 32 9 56 29,3 4 0 11	by div. 95 8 3,0 4 1,3	by div. 100 8 2,0 4 1,0	241,334
	1157	Pos.	71·32 130·12 73·78 128·00	100·720 101·950 100·890	101·335 101·420	101·377	at div. 100 4 4 21,5 8 30,5 12 23,3	at div. 105 4 4 35 8 16,5 12 38	by div. 100 8 2,0 4 1,0	by div. 103 8 3,0 4 1,3	241,138
T = 56·28 B = 29·740	1158	Neg.	128·00 66·80 125·54 69·06	97·400 96·170 97·300	96·783 96·735	96·760	at div. 95 4 16 35,5 20 28 24 38,5	at div. 100 4 16 23 20 41 24 23	by div. 93 8 3,0 4 1,5	by div. 100 8 2,0 4 1,0	241,324

24th Series.—2½-inch hollow *Brass* balls, with bifilar *silk* lines; distance = ·367 inch.

Oct. 15 T = 37·37 B = 29·520	1159	Pos.	89·20 112·50 90·10 111·80	100·830 101·300 100·950	101·075 101·125	101·100	at div. 100 6 37 11 missed. 43 13	at div. 105 6 37 45 missed. 45 51	by div. 100 8 4,0 4 2,0	by div. 105 8 6,0 4 3,0	242,220
	1160	Neg.	111·80 81·50 111·00 82·40	96·630 96·230 96·700	96·450 96·475	96·462	at div. 95 6 49 37,5 53 25 57 43	at div. 100 6 49 11 33 31 37 16	by div. 95 8 5,5 4 2,73	by div. 100 8 3,0 4 2,30	242,677
	1161	Pos.	82·40 119·40 83·46 118·40	100·900 101·430 100·930	101·163 101·180	101·172	at div. 100 7 1 36 3 49 9 40,5	at div. 105 7 1 37 5 27 10 2,5	by div. 100 8 4,3 4 2,23	by div. 103 8 5,3 4 2,75	242,367
Continued.	1162	Neg.	118·40 75·30 117·18 76·38	96·850 96·240 96·780	96·543 96·510	96·527	at div. 95 7 13 57 17 49 22 2	at div. 100 7 13 38,3 18 7 21 43	by div. 95 8 5,0 4 2,50	by div. 100 8 4,3 4 2,25	242,424

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1163	Pos.	76·38 125·18 77·70 123·94	100·780 101·440 100·820	101·110 101·130	101·120	at div. 100 7 25 58 30 7,5 34 2	at div. 105 7 26 14 29 51 34 19	by div. 100 8 4,0 4 2,0	by div. 105 8 5,0 4 2,5	242,112
	1164	Neg.	123·94 69·80 122·40 71·26	96·870 96·100 96·830	96·485 96·465	96·475	at div. 95 7 38 15 42 8 46 19	at div. 100 7 38 0,5 42 23,5 46 4	by div. 95 8 4,0 4 2,00	by div. 100 8 3,5 4 1,75	241,926
	1165	Pos.	71·26 130·00 73·00 128·26	100·630 101·500 100·630	101·065 101·065	101·065	at div. 100 7 50 16 54 24 58 20	at div. 105 7 50 29,5 54 10,5 58 34	by div. 100 8 4,0 4 2,00	by div. 105 8 4,5 4 2,25	242,053
T = 57·47 B = 29·550	1166	Neg.	128·26 65·60 126·20 67·60	96·930 95·900 96·900	96·415 96·400	96·407	at div. 95 8 2 30,5 6 26 10 35	at div. 100 8 2 18,5 6 38,5 10 22	by div. 95 8 4,5 4 2,25	by div. 100 8 3,5 4 1,75	242,110
Oct. 16 T = 55·51 B = 29·434	1167	Pos.	87·34 111·68 88·70 110·90	99·510 100·190 99·800	99·850 99·995	99·922	at div. 98 0 3 46,5 missed. 11 34	at div. 100 0 3 59 missed. 11 48	by div. 98 7 47,5 3 53,75	by div. 100 7 49,0 3 54,50	234,470
	1168	Neg.	110·90 81·28 109·80 82·50	96·090 95·540 96·150	95·815 95·845	95·830	at div. 94 0 16 0 19 36 23 51	at div. 96 0 15 50 19 46,5 23 40,5	by div. 94 7 51,0 3 55,50	by div. 96 7 50,5 3 55,25	235,272
	1169	Pos.	82·50 117·50 84·06 116·50	100·000 100·780 100·280	100·390 100·530	100·460	at div. 100 0 27 38,5 31 37 35 27,5	at div. 105 0 28 0 31 14,5 35 51	by div. 100 7 49,0 3 54,5	by div. 105 7 51,0 3 55,5	234,592
	1170	Neg.	116·50 76·60 115·22 78·08	96·550 95·910 96·650	96·230 96·280	96·255	at div. 95 0 39 32 43 18 47 24	at div. 100 0 39 13 43 37,5 47 3,5	by div. 95 7 52,0 3 56,00	by div. 100 7 50,5 3 55,25	235,812
	1171	Pos.	78·08 122·66 79·10 121·28	100·370 100·880 100·190	100·625 100·535	100·580	at div. 100 0 51 14 55 13,5 59 5,5	at div. 105 0 51 31 54 56 59 23,5	by div. 100 7 51,5 3 55,75	by div. 105 7 52,5 3 56,25	235,808
	1172	Neg.	121·28 72·36 119·70 74·32	96·820 96·030 97·010	96·425 96·520	96·472	at div. 95 1 3 10,5 6 58 11 4,5	at div. 100 1 2 55 7 14 10 48	by div. 95 7 54,0 3 57,0	by div. 100 7 53,0 3 56,5	236,853
	1173	Pos.	74·32 127·08 76·80 125·60	100·700 101·940 101·200	101·320 101·570	101·445	at div. 100 1 14 56,5 19 1,5 22 49,5	at div. 105 1 15 11 18 47 23 5	by div. 100 7 53,0 3 56,5	by div. 105 7 54,0 3 57,0	236,644
Continued.	1174	Neg.	125·60 69·94 124·20 72·30	97·770 97·070 98·250	97·420 97·660	97·540	at div. 95 1 27 3 30 48 35 2,5	at div. 100 1 26 49,5 31 2,5 34 48	by div. 95 7 59,5 3 59,75	by div. 100 7 58,5 3 59,25	239,496

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1175	Pos.	72·30 131·34 74·90 129·50	101·820 103·120 102·200	102·470 102·660	102·565	at div. 100 1 38 50 43 2 46 47	at div. 105 1 39 3 42 48,5 47 1	by div. 100 7 57,0 3 58,5	by div. 105 7 58,0 3 59,0	* 238,756
	1176	Neg.	129·50 68·08 127·14 70·42	98·790 97·610 98·780	98·200 98·195	98·197	at div. 95 1 51 4 missed. 59 4,5	at div. 100 1 50 51,5 missed. 58 51	by div. 95 8 0,5 4 0,25	by div. 100 7 59,5 3 59,75	239,930
	1177	Pos.	70·42 134·02 72·94 131·80	102·220 103·480 102·370	102·850 102·925	102·887	at div. 100 2 2 51 7 5 10 50	at div. 105 2 3 3 6 52,5 11 3	by div. 100 7 59,0 3 59,5	by div. 105 8 0,0 4 0,0	239,789
	1178	Neg.	131·80 66·10 129·00 68·48	98·950 97·550 98·740	98·250 98·145	98·197	at div. 95 2 15 8 18 53 23 9	at div. 100 2 14 56 19 5 22 56	by div. 95 8 1,0 4 0,5	by div. 100 8 0,0 4 0,0	240,180
	1179	Pos.	68·48 135·46 71·10 132·98	101·970 103·280 102·040	102·625 102·660	102·642	at div. 100 2 26 57,5 31 9,5 34 57,5	at div. 105 2 27 8,5 30 58 35 9,5	by div. 100 8 0,0 4 0,0	by div. 105 8 1,0 4 0,5	240,264
T=55·98 B=29·392	1180	Neg.	132·98 64·20 130·28 66·60	98·590 97·240 98·440	97·915 97·840	97·877	at div. 95 2 39 13 missed. 47 13	at div. 100 2 39 9 missed. 47 1	by div. 95 8 0,0 4 0,0	by div. 100 7 59,0 3 59,5	239,712
Oct. 17 T=55·08 B=29·516	1181	Pos.	87·46 112·10 88·30 111·34	99·780 100·200 99·820	99·990 100·010	100·000	at div. 98 10 25 36 29 53,5 33 20,5	at div. 100 10 25 48 29 41 33 33,5	by div. 98 7 44,5 3 52,25	by div. 100 7 45,5 3 52,75	232,750
	1182	Neg.	111·34 80·50 110·28 81·40	95·920 95·390 95·840	95·655 95·615	95·635	at div. 94 10 37 39,5 41 16,5 45 26	at div. 96 10 37 30 41 26,5 45 16	by div. 94 7 46,5 3 53,25	by div. 96 7 46,0 3 53,00	233,046
	1183	Pos.	81·40 117·88 81·70 116·86	99·640 99·790 99·280	99·715 99·535	99·625	at div. 95 10 48 55 53 28,5 56 44	at div. 100 10 49 16 53 7,5 57 6	by div. 95 7 49,0 3 54,5	by div. 100 7 50,0 3 55,0	234,962
	1184	Neg.	116·86 74·04 115·46 75·28	95·450 94·750 95·370	95·100 95·060	95·080	at div. 95 11 1 1 4 53,5 8 49	at div. 100 11 0 43,5 5 12 8 30	by div. 95 7 48,0 3 54,00	by div. 100 7 46,5 3 53,25	233,988
	1185	Pos.	75·28 122·94 77·10 122·08	99·110 100·020 99·590	99·565 99·805	99·685	at div. 95 11 12 32 16 57,5 20 20,5	at div. 100 11 12 48 16 41 20 37,5	by div. 95 7 48,5 3 54,25	by div. 100 7 49,5 3 54,75	234,718
Continued.	1186	Neg.	122·08 70·34 121·30 72·64	96·210 95·820 96·970	96·015 96·395	96·205	at div. 95 11 24 39,5 28 30,5 32 37,5	at div. 100 11 24 25 28 45,5 32 22	by div. 95 7 58,0 3 59,0	by div. 100 7 57,0 3 58,5	238,880

24th SERIES cont.—2½-inch hollow *Brass* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1187	Pos.	72·64 129·32 74·50 128·60	100·980 101·910 101·550	101·445 101·730	101·587	at div. 100 11 36 30 40 35,5 44 23,5	at div. 105 11 36 43,5 40 21,5 44 37,5	by div. 100 7 53,5 3 56,75	by div. 105 7 54,0 3 57,00	• 236,829
T=55·38 B=29·500	1188	Neg.	128·60 67·60 127·02 69·92	98·100 97·310 98·470	97·705 97·890	97·797	at div. 95 11 48 35 52 20 56 34,5	at div. 100 11 48 22,5 52 33 56 21	by div. 95 7 59,5 3 59,75	by div. 100 7 58,5 3 59,25	239,470
Oct. 18 T=55·23 B=29·700	1189	Pos.	87·40 111·90 88·40 111·10	99·650 100·150 99·750	99·900 99·950	99·925	at div. 98 9 0 11,5 4 28 7 55	at div. 100 9 0 23,5 4 15,5 8 8	by div. 98 7 43,5 3 51,75	by div. 100 7 44,5 3 52,25	232,231
	1190	Neg.	111·10 80·62 109·92 81·52	95·860 95·270 95·720	95·565 95·495	95·530	at div. 94 9 12 13 15 50 19 58	at div. 96 9 12 3 16 0 19 47,5	by div. 94 7 45,0 3 52,50	by div. 96 7 44,5 3 52,25	232,309
	1191	Pos.	81·52 117·32 82·70 116·04	99·420 100·010 99·370	99·715 99·690	99·702	at div. 95 9 23 27 28 0 31 11	at div. 100 9 23 48 27 38,5 31 33,5	by div. 95 7 44,0 3 52,00	by div. 100 7 45,5 3 52,75	232,705
	1192	Neg.	116·04 75·26 114·44 76·32	95·650 94·850 95·380	95·250 95·115	95·182	at div. 95 9 35 29,5 39 20,5 43 14	at div. 100 9 35 11 39 40 42 54,5	by div. 95 7 44,5 3 52,25	by div. 100 7 43,5 3 51,75	232,232
	1193	Pos.	76·32 121·60 77·80 120·32	98·960 99·700 99·060	99·330 99·380	99·355	at div. 95 9 46 55 51 17,5 54 40	at div. 100 9 47 11,5 51 0 54 57,5	by div. 95 7 45,0 3 52,5	by div. 100 7 46,0 3 53,0	232,935
	1194	Neg.	120·32 70·76 118·52 72·60	95·540 94·640 95·560	95·090 95·100	95·095	at div. 95 9 58 52 10 2 46 6 41	at div. 100 9 58 37 10 3 1,5 6 24,5	by div. 95 7 49,0 3 54,50	by div. 100 7 47,5 3 53,75	234,486
	1195	Pos.	72·60 125·60 74·80 124·10	99·100 100·200 99·450	99·650 99·825	99·737	at div. 95 10 10 24 14 46 18 12	at div. 100 10 10 38 14 31 18 27	by div. 95 7 48,0 3 54,0	by div. 100 7 49,0 3 54,5	234,474
	1196	Neg.	124·10 68·22 122·52 70·26	96·160 95·370 96·390	95·765 95·880	95·822	at div. 95 10 22 26 26 17,5 30 18	at div. 100 10 22 12,5 26 31,5 30 3,5	by div. 95 7 52,0 3 56,0	by div. 100 7 51,0 3 55,5	235,918
	1197	Pos.	70·26 129·60 72·56 127·92	99·930 101·080 100·240	100·505 100·660	100·582	at div. 100 10 34 12 38 10 42 2,5	at div. 105 10 34 24,5 37 56 42 16	by div. 100 7 50,5 3 55,25	by div. 105 7 51,5 3 55,75	235,308
Continued.	1198	Neg.	127·92 65·88 125·78 68·08	96·900 95·830 96·930	96·365 96·380	96·372	at div. 95 10 46 5,5 49 55 53 58,5	at div. 100 10 45 53,5 50 8 53 45,5	by div. 95 7 53,0 3 56,5	by div. 100 7 52,0 3 56,0	236,363

24th Series cont.—2½-inch hollow *Brass* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1199	Pos.	68·08 132·52 70·54 130·48	100·300 101·530 100·510	100·915 101·020	100·967	at div. 100 10 57 51,5 11 1 52 5 44	at div. 105 10 58 3 11 1 39,5 6 56,5	by div. 100 7 52,5 3 56,25	by div. 105 7 53,5 3 56,75	236,347
	1200	Neg.	130·48 64·00 128·20 66·32	97·240 96·100 97·260	96·670 96·680	96·675	at div. 95 11 9 48 missed. 17 41	at div. 100 11 9 36,5 missed. 17 29	by div. 95 7 53,0 3 56,50	by div. 100 7 52,5 3 56,25	236,416
	1201	Pos.	66·32 135·10 68·90 133·08	100·710 102·000 100·990	101·355 101·495	101·425	at div. 100 11 21 33 25 36 29 25,5	at div. 105 11 21 44 25 24 29 37	by div. 100 7 52,5 3 56,25	by div. 105 7 53,0 3 36,50	236,321
	1202	Neg.	133·08 62·40 130·92 64·76	97·740 96·660 97·840	97·200 97·250	97·225	at div. 95 11 33 32 37 18,5 41 25,5	at div. 100 11 33 21 37 29,5 41 14	by div. 95 7 53,5 3 56,75	by div. 100 7 53,0 3 56,50	236,639
	1203	Pos.	64·76 137·80 67·28 135·80	101·280 102·540 101·540	101·910 102·040	101·975	at div. 100 11 45 14,5 49 18,5 53 6,5	at div. 105 11 45 24,5 49 8 53 17,5	by div. 100 7 52,0 3 56,0	by div. 105 7 53,0 3 56,5	236,197
T = 55·37 B = 29·876	1204	Neg.	135·80 60·68 133·82 62·62	98·240 97·250 98·220	97·745 97·735	97·740	at div. 95 11 57 14,5 0 1 0 5 8,5	at div. 100 11 57 4 0 1 10 4 57,5	by div. 95 7 54,0 3 57,00	by div. 100 7 53,5 3 56,75	236,863
			During was re effect tion of influ	the whole markably on the mo the sus ence ei	of the high and tion of the pension ther the	night, and boister torsion line, *time* or	this morning ous; yet I rod. Once or which I had the *resting*	(during the ex could not disco twice I noticed never observed *point.*	periments), ver that it a *moment* before; but	the wind had any *ary* trepida- it did not	

25th Series.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

Dec. 5 T = 49·80 B = 29·984	1205	Pos.	105·00 138·40 105·42 136·90	121·700 121·910 121·160	121·805 121·535	121·670	at div. 120 10 8 50 missed. 17 7	at div. 125 10 9 15 missed. 17 33	by div. 120 8 17,0 4 8,5	by div. 125 8 18,0 4 9,0	248,667
	1206	Neg.	136·90 96·70 135·14 97·70	116·800 115·920 116·420	116·360 116·170	116·265	at div. 115 10 21 33 25 31 29 48	at div. 120 10 21 13 25 52 29 27	by div. 115 8 15,0 4 7,5	by div. 120 8 14,0 4 7,0	247,374
	1207	Pos.	97·70 144·40 98·70 142·40	121·050 121·550 120·550	121·300 121·050	121·175	at div. 120 10 33 51 38 8 42 9,5	at div. 125 10 34 8 37 50 42 28	by div. 120 8 18,5 4 9,25	by div. 125 8 20,0 4 10,00	249,426
Continued.	1208	Neg.	142·40 90·00 140·60 91·30	116·200 115·300 115·950	115·750 115·625	115·687	at div. 115 10 46 27 50 32 54 44	at div. 120 10 46 11,5 50 48 54 27,5	by div. 115 8 17,0 4 8,5	by div. 120 8 16,0 4 8,0	248,431

25th SERIES continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1209	Pos.	91·30 148·80 92·70 147·10	120·050 120·750 119·900	120·400 120·325	120·362	at div. 120 10 58 54 11 3 5,5 7 12	at div. 125 10 59 8 11 2 51 7 27	by div. 120 8 18,0 4 9,0	by div. 125 8 19,0 4 9,5	* 249,036
	1210	Neg.	147·10 84·10 144·90 85·48	115·600 114·500 115·190	115·050 114·845	114·947	at div. 110 11 11 36 15 17 19 53,5	at div. 115 11 11 23,5 15 31 19 40	by div. 110 8 17,5 4 8,75	by div. 115 8 16,5 4 8,25	248,253
	1211	Pos.	85·48 152·60 86·70 150·90	119·040 119·650 118·800	119·345 119·225	119·285	at div. 115 11 23 41 28 10 31 58	at div. 120 11 23 53 27 58 32 10	by div. 115 8 17,0 4 8,5	by div. 120 8 17,0 4 8,5	248,500
T=49·84 B=30·022	1212	Neg.	150·90 77·70 149·30 79·08	114·300 113·500 114·190	113·900 113·845	113·872	at div. 110 11 36 26 40 16,5 44 40,5	at div. 115 11 36 15 40 27,5 44 29,5	by div. 110 8 14,5 4 7,25	by div. 115 8 14,5 4 7,25	247,250
Dec. 6 T=49·37 B=29·762	1213	Pos.	81·40 106·30 81·90 105·30	93·850 94·100 93·600	93·975 93·850	93·912	at div. 90 9 48 11 53 16 56 35,5	at div. 95 9 48 44 52 42 57 10	by div. 90 8 24,5 4 12,25	by div. 95 8 26,0 4 13,00	252,837
	1214	Neg.	105·30 72·60 103·90 72·80	88·650 87·950 88·350	88·300 88·150	88·225	at div. 85 10 1 36 5 15,5 9 59,5	at div. 90 10 1 11,5 5 41 9 33,5	by div. 85 8 23,5 4 11,75	by div. 90 8 22,0 4 11,00	251,266
	1215	Pos.	72·80 113·30 73·70 111·90	93·050 93·500 92·800	93·275 93·150	93·212	at div. 90 10 13 47 18 25 22 12	at div. 95 10 14 7 18 5 22 33	by div. 90 8 25,0 4 12,5	by div. 95 8 26,0 4 13,0	252,821
	1216	Neg.	111·90 64·04 110·10 65·00	87·970 87·070 87·550	87·520 87·310	87·415	at div. 85 10 26 50 30 45,5 35 15	at div. 90 10 26 33 31 3 34 57	by div. 85 8 25,0 4 12,5	by div. 90 8 24,0 4 12,0	252,259
	1217	Pos.	65·00 119·00 66·60 117·40	92·000 92·800 92·000	92·400 92·400	92·400	at div. 90 10 39 16 43 44 47 43	at div. 95 10 39 31 43 28,5 47 59	by div. 90 8 27,0 4 13,5	by div. 95 8 28,0 4 14,0	253,740
	1218	Neg.	117·40 57·54 115·30 59·10	87·470 86·420 87·200	86·945 86·810	86·877	at div. 85 10 52 11,5 56 15 11 0 38,5	at div. 90 10 51 58 56 29 11 0 24	by div. 85 8 27,0 4 13,5	by div. 90 8 26,0 4 13,0	253,312
	1219	Pos.	59·10 123·92 61·00 121·90	91·510 92·460 91·450	91·985 91·955	91·970	at div. 90 11 4 44 9 7 13 10,5	at div. 95 11 4 56,5 8 54,5 13 24	by div. 90 8 26,5 4 13,25	by div. 95 8 27,5 4 13,75	253,447
T=49·42 B=29·700	1220	Neg.	121·90 52·40 119·60 54·30	87·150 86·000 86·950	86·575 86·475	86·525	at div. 85 11 17 34,5 21 41 26 1,5	at div. 90 11 17 23 21 53 25 49	by div. 85 8 27,0 4 13,5	by div. 90 8 26,0 4 13,0	253,348

25th SERIES continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Dec. 7 T=48·62 B=29·922	1221	Pos.	82·80 128·18 83·90 126·80	105·490 106·040 105·350	105·765 105·695	105·730	at div. 105 10 3 45 7 59 12 3	at div. 110 10 4 2,5 7 41 12 21,5	by div. 105 8 18,0 4 9,0	by div. 110 8 19,0 4 9,5	* 249,073
	1222	Neg.	126·80 75·00 124·90 76·30	100·900 99·950 100·600	100·425 100·275	100·350	at div. 100 10 16 18 20 24 24 35	at div. 105 10 16 2,5 20 40 24 18,5	by div. 100 8 17,0 4 8,5	by div. 105 8 16,0 4 8,0	248,465
	1223	Pos.	76·30 133·12 77·80 131·34	104·710 105·460 104·570	105·085 105·015	105·050	at div. 105 10 28 46 32 55 37 4,5	at div. 110 10 29 0 32 41 37 19,5	by div. 105 8 18,5 4 9,25	by div. 110 8 19,5 4 9,75	249,255
	1224	Neg.	131·34 69·00 129·12 70·50	100·170 99·060 99·810	99·615 99·435	99·525	at div. 95 10 41 27,5 45 12 49 45	at div. 100 10 41 15 45 25,5 49 31,5	by div. 95 8 17,5 4 8,75	by div. 100 8 16,5 4 8,25	248,298
	1225	Pos.	70·50 137·12 72·50 134·90	103·810 104·810 103·700	104·310 104·255	104·282	at div. 100 10 53 34 58 4,5 11 1 52,5	at div. 105 10 53 46 57 52 11 2 5	by div. 100 8 18,5 4 9,25	by div. 105 8 19,0 4 9,50	249,464
	1226	Neg.	134·90 63·90 132·40 65·64	99·400 98·150 99·020	98·775 98·585	98·680	at div. 95 11 6 23 10 15 14 40,5	at div. 100 11 6 11,5 10 26,5 14 28,5	by div. 95 8 17,5 4 8,75	by div. 100 8 17,0 4 8,50	248,556
	1227	Pos.	65·64 140·30 67·70 137·70	102·970 104·000 102·700	103·485 103·350	103·417	at div. 100 11 18 36 23 0 26 54,5	at div. 105 11 18 46,5 22 49 27 5,5	by div. 100 8 18,5 4 9,25	by div. 105 8 19,0 4 9,50	249,421
T=48·62 B=29·912	1228	Neg.	137·70 59·80 134·90 61·60	98·750 97·350 98·250	98·050 97·800	97·925	at div. 95 11 31 19,5 35 16,5 39 37	at div. 100 11 31 9 35 27 39 26	by div. 95 8 17,5 4 8,75	by div. 100 8 17,0 4 8,50	248,604
Dec. 8 T=49·28 B=29·490	1229	Pos.	72·80 122·84 74·60 121·30	97·820 98·720 97·950	98·270 98·335	98·302	at div. 95 9 58 42,5 10 3 19 7 10,5	at div. 100 9 59 59 10 3 2 8 28	by div. 95 8 28,0 4 14,0	by div. 100 8 29,0 4 14,5	254,330
	1230	Neg.	121·30 65·50 119·40 66·94	93·400 92·450 93·170	92·925 92·810	92·867	at div. 90 10 11 47 15 44 20 15	at div. 95 10 11 32,5 15 59 19 59,5	by div. 90 8 28,0 4 14,0	by div. 95 8 27,0 4 13,5	253,713
	1231	Pos.	66·94 128·18 68·86 126·30	97·560 98·520 97·580	98·040 98·050	98·045	at div. 95 10 24 15,5 28 46 32 42,5	at div. 100 10 24 28,5 28 32 32 56,5	by div. 95 8 27,0 4 13,5	by div. 100 8 28,0 4 14,0	253,804
Continued.	1232	Neg.	126·30 60·20 124·00 62·20	93·250 92·100 93·100	92·675 92·600	92·637	at div. 90 10 37 14 41 14,5 45 41,5	at div. 95 10 37 1,5 41 27 45 28,5	by div. 90 8 27,5 4 13,75	by div. 95 8 27,0 4 13,50	253,618

25th Series continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1233	Pos.	62·20 132·50 64·70 130·10	97·350 98·600 97·400	97·975 98·000	97·987	at div. 95 10 49 44 54 11,5 58 11	at div. 100 10 49 56 54 0 58 23,5	by div. 95 8 27,0 4 13,50	by div. 100 8 27,5 4 13,75	* 253,649
	1234	Neg.	130·10 56·30 127·50 58·80	93·200 91·900 93·150	92·550 92·525	92·537	at div. 90 11 2 38,5 6 41 11 6,5	at div. 95 11 2 28 6 52,5 10 55	by div. 90 8 28,0 4 14,0	by div. 95 8 27,0 4 13,5	253,746
	1235	Pos.	58·80 135·48 61·50 132·80	97·140 98·490 97·150	97·815 97·820	97·817	at div. 95 11 15 11 19 37 23 38,5	at div. 100 11 15 22 19 26 23 50	by div. 95 8 27,5 4 13,75	by div. 100 8 28,0 4 14,00	253,891
	1236	Neg.	132·80 53·50 129·80 56·00	93·150 91·650 92·900	92·400 92·275	92·337	at div. 90 11 28 5 32 9 36 32	at div. 95 11 27 55 32 19,5 36 21	by div. 90 8 27,0 4 13,5	by div. 95 8 26,0 4 13,0	253,266
	1237	Pos.	56·00 137·50 58·88 134·70	96·750 98·190 96·790	97·470 97·490	97·480	at div. 95 11 40 37,5 45 1 49 4	at div. 100 11 40 47,5 44 51 49 14,5	by div. 95 8 26,5 4 13,25	by div. 100 8 27,0 4 13,50	253,374
	1238	Neg.	134·70 51·16 131·52 53·96	92·930 91·340 92·740	92·135 92·040	92·087	at div. 90 11 53 27,5 57 33 0 1 54	at div. 95 11 53 18 57 43 0 1 44	by div. 90 8 26,5 4 13,25	by div. 95 8 26,0 4 13,00	253,146
	1239	Pos.	53·96 139·00 57·06 135·90	96·480 98·030 96·480	97·255 97·255	97·255	at div. 95 0 6 0,5 10 22 14 26	at div. 100 0 6 10,5 10 12,5 14 36,5	by div. 95 8 25,5 4 12,75	by div. 100 8 26,0 4 13,00	252,863
	1240	Neg.	135·90 49·50 132·60 52·42	92·700 91·050 92·510	91·875 91·780	91·827	at div. 90 0 18 48 22 54 27 14	at div. 95 0 18 38,5 23 4 27 4	by div. 90 8 26, 4 13,00	by div. 95 8 25,5 4 12,75	252,909
	1241	Pos.	52·42 139·82 55·70 136·58	96·120 97·760 96·140	96·940 96·945	96·942	at div. 95 0 31 21,5 35 41,5 39 47	at div. 100 0 31 30,5 35 32 39 57	by div. 95 8 25,5 4 12,75	by div. 100 8 26,5 4 13,25	252,944
T = 50·23 B = 29·424	1242	Neg.	136·58 48·18 132·94 51·30	92·380 90·560 92·120	91·470 91·340	91·405	at div. 90 0 44 7,5 48 14 52 32	at div. 95 0 43 59 48 24 52 22,5	by div. 90 8 24,5 4 12,25	by div. 95 8 23,5 4 11,75	252,110
Dec. 10 T = 47·95 B = 29·362	1243	Pos.	95·90 148·90 97·70 147·20	122·400 123·300 122·450	122·850 122·875	122·862	at div. 120 9 58 34 10 3 4,5 6 1	at div. 125 9 58 49 10 2 49 7 17	by div. 120 8 27,0 4 13,5	by div. 125 8 28,0 4 14,0	253,786
Continued.	1244	Neg.	147·20 87·80 145·20 90·50	117·500 116·500 117·850	117·000 117·175	117·087	at div. 115 10 11 33 15 33 19 0,5	at div. 120 10 11 19 15 47,5 19 45,5	by div. 115 8 27,5 4 13,75	by div. 120 8 26,5 4 13,25	253,541

25th SERIES continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1245	Pos.	90·50 153·84 92·60 151·90	122·170 123·220 122·250	122·695 122·735	122·715	at div. 120 10 24 3,5 28 31 32 30	at div. 125 10 24 16,5 28 18 32 43,5	by div. 120 8 26,5 4 13,25	by div. 125 8 27,0 4 13,50	253,386
	1246	Neg.	151·90 83·50 149·72 85·80	117·700 116·610 117·260	117·155 116·935	117·045	at div. 115 10 36 58,5 41 1 45 25,5	at div. 120 10 36 46 41 13,5 45 12,5	by div. 115 8 27,0 4 13,50	by div. 120 8 26,5 4 13,25	253,398
	1247	Pos.	85·80 158·00 88·48 155·78	121·900 123·240 122·130	122·570 122·685	122·627	at div. 120 10 49 31,5 53 57 57 58	at div. 125 10 49 43 53 45 58 10	by div. 120 8 26,5 4 13,25	by div. 125 8 27,0 4 13,50	253,381
	1248	Neg.	155·78 80·30 153·20 82·80	118·040 116·750 118·000	117·395 117·375	117·385	at div. 115 11 2 25 6 28 10 52	at div. 120 11 2 14 6 39 10 40,5	by div. 115 8 27,0 4 13,50	by div. 120 8 26,5 4 13,25	253,381
	1249	Pos.	82·80 161·22 85·60 158·50	122·010 123·410 122·050	122·710 122·730	122·720	at div. 120 11 14 57,5 19 22 23 24,5	at div. 125 11 15 8 19 11,5 23 35,5	by div. 120 8 27,0 4 13,50	by div. 125 8 27,5 4 13,75	253,636
T=48·43 B=29·320	1250	Neg.	158·50 77·80 155·30 80·40	118·150 116·550 117·850	117·350 117·200	117·275	at div. 115 11 27 50,5 31 55,5 36 18	at div. 120 11 27 40,5 32 6 36 7	by div. 115 8 27,5 4 13,75	by div. 120 8 26,5 4 13,25	253,523

26th SERIES.—2½-inch hollow *Brass* balls, with *single* copper wire; diameter = ·0219 inch.

Dec. 11 T=47·52 B=29·924	1251	Pos.	56·90 137·50 60·00 134·80	97·200 98·750 97·400	97·975 98·075	98·025	at div. 95 10 6 25 10 11,5 13 35	at div. 100 10 6 33,5 10 2,5 13 44,5	by div. 95 7 10,0 3 35,0	by div. 100 7 11,0 3 35,5	215,302
	1252	Neg.	134·80 55·38 131·80 58·20	95·090 93·590 95·000	94·340 94·295	94·317	at div. 90 10 17 25 20 45,5 24 36	at div. 95 10 17 16 21 24 24 26,5	by div. 90 7 11,0 3 35,50	by div. 95 7 10,5 3 35,25	215,284
	1253	Pos.	58·20 136·16 61·30 133·00	97·180 98·730 97·150	97·955 97·940	97·947	at div. 95 10 27 59,5 31 45,5 35 11	at div. 100 10 28 8 31 36,5 35 20	by div. 95 7 11,5 3 35,75	by div. 100 7 12,0 3 36,00	215,897
T=47·43 B=29·924	1254	Neg.	133·00 56·90 129·60 59·56	94·950 93·250 94·580	94·100 93·915	94·007	at div. 90 10 39 2 42 22,5 46 13,5	at div. 95 10 38 52,5 42 31,5 46 3,5	by div. 90 7 11,5 3 35,75	by div. 95 7 11,0 3 35,50	215,549
Dec. 12 T=46·38 B=29·650 Continued.	1255	Pos.	76·10 121·80 78·08 120·10	98·950 99·940 99·090	99·455 99·515	99·480	at div. 95 9 56 10 10 0 17 3 27,5	at div. 100 9 56 25,5 10 0 1 3 44	by div. 95 7 17,5 3 38,75	by div. 100 7 18,5 3 39,25	219,198

26th SERIES cont.—2½-inch hollow *Brass* balls, with *single* copper wire; diam. = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N.		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1256	Neg.	120·10 71·98 117·80 73·50	96·040 94·890 95·650	95·465 95·270	95·367	at div. 95 10 7 25,5 11 3 14 43	at div. 100 10 7 11 11 18 14 27	by div. 95 7 17,5 3 38,75	by div. 100 7 16,0 3 38,00	218,695
	1257	Pos.	73·50 123·70 75·52 121·66	98·600 99·610 98·590	99·105 99·100	99·102	at div. 95 10 18 14,5 22 17 25 34	at div. 100 10 18 28 22 2 25 49	by div. 95 7 19,5 3 39,75	by div. 100 7 21,0 3 40,50	220,365
	1258	Neg.	121·66 69·50 119·20 71·30	95·580 94·350 95·250	94·965 94·800	94·882	at div. 90 10 29 42 32 46 37 4,5	at div. 95 10 29 28,5 33 10 36 50	by div. 90 7 22,5 3 41,25	by div. 95 7 21,5 3 40,75	220,762
	1259	Pos.	71·30 124·90 73·30 122·84	98·100 99·100 98·070	98·600 98·585	98·592	at div. 95 10 40 24 44 24,5 47 45	at div. 100 10 40 37 44 10,5 47 59	by div. 95 7 21,0 3 40,50	by div. 100 7 22,0 3 41,00	220,859
	1260	Neg.	122·84 67·30 120·32 69·20	95·070 93·810 94·760	94·440 94·285	94·362	at div. 90 10 51 48,5 55 6,5 59 10,5	at div. 95 10 51 36 55 20 58 56,5	by div. 90 7 22,0 3 41,00	by div. 95 7 20,5 3 40,25	220,346
	1261	Pos.	69·20 126·06 71·28 123·40	97·630 98·670 97·340	98·150 98·005	98·077	at div. 95 11 2 35 6 32 9 57	at div. 100 11 2 47,5 6 19 10 10,5	by div. 95 7 22,0 3 41,0	by div. 100 7 23,0 3 41,5	221,308
	1262	Neg.	123·40 65·50 121·80 67·90	94·450 93·650 94·850	94·050 94·250	94·150	at div. 90 11 14 0 17 21,5 21 25,5	at div. 95 11 13 48 17 34 21 12,5	by div. 90 7 25,5 3 42,75	by div. 95 7 24,5 3 42,25	222,335
	1263	Pos.	67·90 127·20 70·62 124·88	97·550 98·910 97·750	98·230 98·330	98·280	at div. 95 11 24 51,5 28 50 32 15,5	at div. 100 11 25 3,5 28 37,5 32 28,5	by div. 95 7 24,0 3 42,0	by div. 100 7 25,0 3 42,5	222,328
	1264	Neg.	124·88 65·10 122·28 67·70	94·990 93·690 94·990	94·340 94·340	94·340	at div. 90 11 36 18 39 39 43 43	at div. 95 11 36 6 39 52 43 30	by div. 90 7 25,0 3 42,5	by div. 95 7 24,0 3 42,0	222,066
T=46·95 B=29·502	1265	Pos.	67·70 127·72 70·54 125·20	97·710 99·130 97·870	98·420 98·500	98·460	at div. 95 11 47 8 51 7 54 31,5	at div. 100 11 47 20 50 54 54 44,5	by div. 95 7 23,5 3 41,75	by div. 100 7 24,5 3 42,25	222,096
Dec. 13 T=49·63 B=29·368	1266	Pos.	83·00 115·70 84·50 114·20	99·350 100·100 99·350	99·725 99·725	99·725	at div. 95 10 0 43 5 7 8 5	at div. 100 10 1 5 4 44 8 29	by div. 95 7 22,0 3 41,0	by div. 100 7 24,0 3 42,0	221,945
Continued.	1267	Neg.	114·20 77·84 112·58 79·34	96·020 95·210 95·960	95·615 95·585	95·600	at div. 95 10 12 15 15 52 19 38	at div. 100 10 11 55 16 12,5 19 16,5	by div. 95 7 23,0 3 41,50	by div. 100 7 21,5 3 40,75	221,410

26th SERIES cont.—2½-inch hollow *Brass* balls, with *single* copper wire; diam. = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1268	Pos.	79·34 118·90 81·00 117·12	99·120 99·950 99·060	99·535 99·505	99·520	at div. 95 10 23 4 27 18,5 30 25,5	at div. 100 10 23 22 27 0 30 45,5	by div. 95 7 21,5 3 40,75	by div. 100 7 23,5 3 41,75	221,654
	1269	Neg.	117·12 74·90 115·20 76·68	96·010 95·050 95·940	95·530 95·495	95·512	at div. 95 10 34 29 38 7 41 52	at div. 100 10 34 12 58 25 41 33,5	by div. 95 7 23,0 5 41,50	by div. 100 7 21,5 3 40,75	221,422
	1270	Pos.	76·68 121·50 78·66 119·32	98·990 99·980 98·990	99·485 99·485	99·485	at div. 95 10 45 20,5 49 31 52 42,5	at div. 100 10 45 37 49 14,5 53 0,5	by div. 95 7 22,0 3 41,00	by div. 100 7 25,5 3 41,75	221,675
	1271	Neg.	119·32 72·62 117·10 74·60	95·970 94·860 95·850	95·415 95·555	95·385	at div. 95 10 56 45 11 0 22,5 4 6	at div. 100 10 56 27,5 11 0 38,5 3 49	by div. 95 7 23,0 5 41,50	by div. 100 7 21,5 3 40,75	221,442
	1272	Pos.	74·60 122·90 76·80 120·80	98·750 99·850 98·800	99·300 99·525	99·512	at div. 95 11 7 57 11 44 14 59	at div. 100 11 7 51,5 11 29 15 15	by div. 95 7 22,0 3 41,00	by div. 100 7 23,5 3 41,75	221,647
	1273	Neg.	120·80 71·00 118·52 73·12	95·900 94·760 95·820	95·330 95·290	95·310	at div. 95 11 18 57 22 37 26 20	at div. 100 11 18 42,5 22 52 26 4	by div. 95 7 23,0 3 41,50	by div. 100 7 21,5 3 40,75	221,454
	1274	Pos.	73·12 124·02 75·70 121·82	98·570 99·860 98·760	99·215 99·310	99·262	at div. 95 11 29 51,5 33 57 37 13,5	at div. 100 11 30 5,5 33 42,5 37 28,5	by div. 95 7 22,0 5 41,0	by div. 100 7 23,0 3 41,5	221,426
	1275	Neg.	121·82 69·82 119·20 72·10	95·820 94·510 95·650	95·165 95·080	95·122	at div. 95 11 41 9,5 44 50 48 32	at div. 100 11 40 56 45 4,5 48 17	by div. 95 7 22,5 5 41,25	by div. 100 7 21,0 3 40,50	221,232
	1276	Pos.	72·10 124·74 74·70 122·30	98·420 99·720 98·500	99·070 99·110	99·090	at div. 95 11 52 4 56 7 59 25	at div. 100 11 52 17,5 55 53 59 40	by div. 95 7 21,0 3 40,50	by div. 100 7 22,5 3 41,25	221,114
	1277	Neg.	122·30 68·94 119·80 71·38	95·620 94·370 95·590	94·995 94·980	94·987	at div. 90 0 3 33 6 47 10 56	at div. 95 0 5 19,5 7 1 10 41	by div. 90 7 23,0 3 41,50	by div. 95 7 21,5 3 40,75	220,752
	1278	Pos.	71·38 125·10 73·80 122·72	98·240 99·450 98·260	98·845 98·855	98·850	at div. 95 0 14 14 18 16 21 34,5	at div. 100 0 14 27,5 18 2 21 49,5	by div. 95 7 20,5 3 40,25	by div. 100 7 22,0 3 41,00	220,827
Continued.	1279	Neg.	122·72 68·40 119·90 70·80	95·560 94·150 95·550	94·855 94·750	94·802	at div. 90 0 25 41,5 28 57 53 4,5	at div. 95 0 25 28 29 10 52 49,5	by div. 90 7 23,0 3 41,50	by div. 95 7 21,5 3 40,75	220,780

26th SERIES cont.—2½-inch hollow *Brass* balls, with *single* copper wire; diam. = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1280	Pos.	70·80 125·20 73·34 122·72	98·000 99·270 98·030	98·635 98·650	98·642	at div. 95 0 36 23,5 40 23,5 43 44	at div. 100 0 36 37 40 10 43 58,5	by div. 95 7 20,5 3 40,25	by div. 100 7 21,5 3 40,75	* 220,614
	1281	Neg.	122·72 68·00 119·88 70·42	95·360 93·940 95·150	94·650 94·545	94·597	at div. 90 0 47 49 51 20 55 12	at div. 95 0 47 36,5 51 33,5 54 58	by div. 90 7 23,0 3 41,50	by div. 95 7 21,5 3 40,75	220,810
	1282	Pos.	70·42 125·10 73·00 122·62	97·760 99·050 97·810	98·405 98·430	98·417	at div. 95 0 58 32,5 1 2 32 5 53	at div. 100 0 58 46,5 1 2 18 6 7,5	by div. 95 7 20,5 3 40,25	by div. 100 7 21,5 3 40,75	220,592
	1283	Neg.	122·62 67·70 119·84 70·00	95·160 93·770 94·920	94·465 94·345	94·405	at div. 90 1 9 56 13 13 17 18,5	at div. 95 1 9 43 13 27 17 4	by div. 90 7 22,5 3 41,25	by div. 95 7 21,0 3 40,50	220,589
	1284	Pos.	70·00 125·00 72·86 122·42	97·500 98·930 97·640	98·215 98·285	98·250	at div. 95 1 20 41 24 38,5 28 1,5	at div. 100 1 20 54 24 25 28 15,5	by div. 95 7 20,5 3 40,25	by div. 100 7 21,5 3 40,75	220,575
	1285	Neg.	122·42 67·42 119·60 69·80	94·920 93·510 94·700	94·215 94·105	94·160	at div. 90 1 32 3 35 22 39 25	at div. 95 1 31 50 35 36 39 11	by div. 90 7 22,0 3 41,0	by div. 95 7 21,0 3 40,5	220,584
T = 50·95 B = 29·312	1286	Pos.	69·80 124·82 72·80 122·02	97·310 98·810 97·410	98·060 98·110	98·085	at div. 95 1 42 49,5 46 47 50 10	at div. 100 1 43 2 46 34 50 24	by div. 95 7 20,5 3 40,25	by div. 100 7 22,0 3 41,00	220,787
Dec. 14 T = 49·72 B = 29·582	1287	Neg.	156·90 87·60 153·52 90·60	122·250 120·560 122·060	121·405 121·310	121·357	at div. 120 9 45 59,5 49 30 53 10,5	at div. 125 9 45 50 49 40 53 0	by div. 120 7 11,0 3 35,5	by div. 125 7 10,0 3 35,0	215,364
	1288	Pos.	90·60 157·90 93·80 154·82	124·250 125·850 124·310	125·050 125·080	125·065	at div. 125 9 56 45,5 10 0 21 3 57	at div. 130 9 56 56 10 0 10 4 8,5	by div. 125 7 11,5 3 35,75	by div. 130 7 12,5 3 36.25	215,756
	1289	Neg.	154·82 89·10 151·50 91·90	121·960 120·300 121·700	121·130 121·000	121·065	at div. 120 10 7 37 11 8 14 48	at div. 125 10 7 26 11 19 14 36	by div. 120 7 11,0 3 35,5	by div. 125 7 10,0 3 35,0	215,394
	1290	Pos.	91·90 155·86 95·02 152·90	123·880 125·440 123·960	124·660 124·700	124·680	at div. 120 10 18 13,5 22 10 25 24,5	at div. 125 10 18 24,5 21 59 25 36,5	by div. 120 7 11,0 3 35,5	by div. 125 7 12,0 3 36,0	215,968
Continued.	1291	Neg.	152·90 90·32 149·70 92·98	121·610 120·010 121·340	120·810 120·675	120·742	at div. 120 10 29 14,5 32 47,5 36 26	at div. 125 10 29 3,5 32 59 36 14	by div. 120 7 11,5 3 35,75	by div. 125 7 10,5 3 35,25	215,676

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26th Series cont.—2½-inch hollow *Brass* balls, with *single* copper wire; diam. = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1292	Pos.	92·98 154·30 95·90 151·50	123·640 125·100 123·700	124·570 124·400	124·385	at div. 120 10 39 52,5 45 49 47 4	at div. 125 10 40 4 45 37 47 16,5	by div. 120 7 11,5 3 55,75	by div. 125 7 12,5 3 36,25	* 216,188
	1295	Neg.	151·50 91·00 148·56 95·72	121·250 119·780 121·140	120·515 120·460	120·487	at div. 120 10 50 55 54 27 58 5	at div. 125 10 50 41,5 54 59,5 57 52,5	by div. 120 7 12,0 3 36,0	by div. 125 7 11,0 3 35,5	215,951
	1294	Pos.	95·72 153·16 96·60 150·40	123·440 124·880 125·500	124·160 124·190	124·175	at div. 120 11 1 32 5 28 8 43	at div. 125 11 1 44 5 16 8 56	by div. 120 7 11,0 3 35,5	by div. 125 7 12,0 3 36,0	215,917
	1295	Neg.	150·40 91·80 147·30 94·30	121·100 119·550 120·800	120·325 120·175	120·250	at div. 120 11 12 31,5 16 6 19 42,5	at div. 125 11 12 19 16 19 19 29	by div. 120 7 11,0 3 35,5	by div. 125 7 10,0 3 35,0	215,475
T = 49·53 B = 29·692	1296	Pos.	94·30 151·60 97·40 148·18	122·950 124·500 122·790	125·725 123·645	125·685	at div. 120 11 23 11,5 27 6 30 22,5	at div. 125 11 23 23,5 26 55,5 30 36	by div. 120 7 11,0 5 55,50	by div. 125 7 12,5 5 36,25	216,053

27th Series.—1½-inch *Platina* balls, with *single* copper wire; diameter = ·0219 inch.

Dec. 16 T = 46·20 B = 29·400	1297	Pos.	60·60 172·50 65·60 169·50	116·550 118·050 116·450	117·300 117·250	117·275	at div. 115 9 51 4 54 49 58 23	at div. 120 9 51 10 54 42 58 29,5	by div. 115 7 19,0 5 39,50	by div. 120 7 19,5 3 39,75	219,614
	1298	Neg.	169·30 58·98 165·90 61·60	114·140 112·440 113·750	113·290 113·095	113·192	at div. 110 10 2 10 5 42 9 29	at div. 115 10 2 5,5 5 48 9 22,5	by div. 110 7 19,0 3 39,5	by div. 115 7 19,0 5 59,5	219,500
	1299	Pos.	61·60 170·66 64·70 167·60	116·130 117·680 116·150	116·905 116·915	116·910	at div. 115 10 13 3,5 16 47,5 20 22,5	at div. 120 10 13 10 16 41 20 29,5	by div. 115 7 19,0 5 39,50	by div. 120 7 19,5 3 59,75	219,595
	1300	Neg.	167·60 59·10 164·70 61·54	115·350 111·900 115·120	112·625 112·510	112·567	at div. 110 10 24 9 27 42 31 28,5	at div. 115 10 24 2,5 27 48,5 31 21,5	by div. 110 7 19,5 3 39,75	by div. 115 7 19,0 3 39,50	219,622
	1501	Pos.	61·54 169·92 64·20 167·38	115·780 117·060 115·790	116·420 116·425	116·422	at div. 115 10 35 4 38 48 42 24,5	at div. 120 10 35 10,5 38 41,5 42 31,5	by div. 115 7 20,5 3 40,25	by div. 120 7 21,0 3 40,50	220,321
Continued.	1302	Neg.	167·38 58·70 164·80 61·20	113·040 111·750 115·000	112·395 112·575	112·585	at div. 110 10 46 11 49 46 53 35	at div. 115 10 46 4,5 49 52 53 26	by div. 110 7 22,0 3 41,00	by div. 115 7 21,5 3 40,75	220,881

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1303	Pos.	61·20 170·20 64·20 167·54	115·700 117·200 115·870	* 116·450 116·535	116·492	at div. 115 10 57 10,5 11 0 55,5 4 33	at div. 120 10 57 17 11 0 49 4 40	by div. 115 7 22,5 3 41,25	by div. 120 7 23,0 3 41,50	* 221,325
	1304	Neg.	167·54 59·20 164·80 62·22	113·370 112·000 113·510	112·685 112·755	112·720	at div. 110 11 8 21 11 56 15 45	at div. 115 11 8 14,5 12 3 15 38	by div. 110 7 24,0 3 42,00	by div. 115 7 23,5 3 41,75	221,864
	1305	Pos.	62·22 170·20 65·50 167·60	116·210 117·850 116·550	117·030 117·200	117·115	at div. 115 11 19 21,5 23 8 26 45	at div. 120 11 19 28 23 2 26 52	by div. 115 7 23,5 3 41,75	by div. 120 7 24,0 3 42,00	221,856
	1306	Neg.	167·60 60·52 164·94 63·50	114·060 112·730 114·220	113·395 113·475	113·435	at div. 110 11 30 35 34 8 37 59,5	at div. 115 11 30 28,5 34 14 37 52,5	by div. 110 7 24,5 3 42,25	by div. 115 7 24,0 3 42,00	222,079
	1307	Pos.	63·50 170·30 66·80 167·60	116·900 118·550 117·200	117·725 117·875	117·800	at div. 115 11 41 35 45 24 48 59	at div. 120 11 41 41,5 45 17 49 6	by div. 115 7 24,0 3 42,00	by div. 120 7 24,5 3 42,25	222,140
T=46·41 B=29·340	1308	Neg.	167·60 61·62 164·80 64·50	114·610 113·210 114·650	113·910 113·930	113·920	at div. 110 11 52 50,5 56 23 0 0 14,5	at div. 115 11 52 44 56 30 0 0 7,5	by div. 110 7 24,0 3 42,00	by div. 115 7 23,5 3 41,75	221,804
Dec. 18 T=39·98 B=29·590	1309	Pos.	104·30 138·80 105·20 138·20	121·550 122·000 121·700	121·775 121·850	121·812	at div. 120 9 59 44 10 3 40 7 4,5	at div. 125 10 0 5 3 18 7 26,5	by div. 120 7 20,5 3 40,25	by div. 125 7 21,5 3 40,75	220,431
	1310	Neg.	138·20 98·00 137·60 99·00	118·100 117·800 118·300	117·950 118·050	118·000	at div. 115 10 11 6 14 26 18 27	at div. 120 10 10 48,5 14 43 18 9	by div. 115 7 21,0 3 40,50	by div. 120 7 20,5 3 40,25	220,350
	1311	Pos.	99·00 144·80 100·06 144·10	121·900 122·430 122·080	122·165 122·255	122·190	at div. 120 10 21 52,5 25 45,5 29 12	at div. 125 10 22 8 25 30 29 28	by div. 120 7 19,5 3 39,75	by div. 125 7 20,0 3 40,00	219,859
T=39·78 B=29·578	1312	Neg.	144·10 93·40 143·00 94·50	118·750 118·200 118·750	118·475 118·475	118·475	at div. 115 10 33 10 36 31 40 30,5	at div. 120 10 32 56 36 45 40 16	by div. 115 7 20,5 3 40,25	by div. 120 7 20,0 3 40,00	220,076
Dec. 19 T=35·82 B=29·260	1313	Pos.	72·30 120·60 73·10 119·60	96·450 96·850 96·350	96·650 96·600	96·625	at div. 95 10 1 10 4 58 8 27,5	at div. 100 10 1 24,5 4 43,5 8 42,5	by div. 95 7 17,5 3 38,75	by div. 100 7 18,0 3 39,00	218,831
Continued.	1314	Neg.	119·60 66·52 118·50 67·50	93·060 92·510 93·000	92·785 92·755	92·770	at div. 90 10 12 30 15 42,5 19 36,5	at div. 95 10 12 7 15 56,5 19 23	by div. 90 7 16,5 3 38,25	by div. 95 7 16,0 3 38,00	218,112

27th SERIES cont.—1⅓-inch *Platina* balls, with *single* copper wire; diameter= ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1315	Pos.	67·50 125·10 68·90 123·80	96·300 97·000 96·350	96·650 96·675	96·662	at div. 95 10 23 6 26 52 30 22,5	at div. 100 10 23 18 26 40 30 35	by div. 95 7 16,5 3 38,25	by div. 100 7 17,0 3 38,50	218,333
	1316	Neg.	123·80 62·56 122·10 64·00	93·180 92·330 93·050	92·755 92·690	92·722	at div. 90 10 34 13 37 38,5 41 30	at div. 95 10 34 1,5 37 50 41 17,5	by div. 90 7 17,0 3 38,5	by div. 95 7 16,0 3 38,0	218,228
	1317	Pos.	64·00 128·20 65·80 126·60	96·100 97·000 96·200	96·550 96·600	96·575	at div. 95 10 44 59,5 48 44,5 52 15	at div. 100 10 45 10,5 48 33 52 26,5	by div. 95 7 15,5 3 37.75	by div. 100 7 16,0 3 38,00	217,829
	1318	Neg.	126·60 59·90 124·50 61·70	93·250 92·200 93·100	92·725 92·650	92·687	at div. 90 10 56 3,5 59 31 11 3 19	at div. 95 10 55 53,5 59 40,5 11 3 8	by div. 90 7 15,5 3 37,75	by div. 95 7 14,5 3 37,25	217,481
	1319	Pos.	61·70 130·02 63·76 128·20	95·860 96·890 95·980	96·375 96·435	96·405	at div. 95 11 6 48,5 10 32 14 2,5	at div. 100 11 6 59 10 21,5 14 13,5	by div. 95 7 14,0 3 37,00	by div. 100 7 14,5 3 37,25	217,070
	1320	Neg.	128·20 58·00 126·08 59·80	93·100 92·040 92·940	92·570 92·490	92·530	at div. 90 11 17 49 21 15,5 25 3	at div. 95 11 17 39 21 25,5 24 52,5	by div. 90 7 14,0 3 37,00	by div. 95 7 13,5 3 36,75	216,874
	1321	Pos.	59·80 131·84 61·00 130·50	95·820 96·420 95·750	96·120 96·085	96·102	at div. 95 11 28 34 32 15 35 47,5	at div. 100 11 28 43,5 32 5 35 57,5	by div. 95 7 13,5 3 36,75	by div. 100 7 14,0 3 37,00	216,805
	1322	Neg.	130·50 54·98 128·04 57·14	92·740 91·510 92·590	92·125 92·050	92·087	at div. 90 11 39 32 43 0,5 46 4,5	at div. 95 11 39 22,5 43 10 46 35	by div. 90 7 13,0 3 36,50	by div. 95 7 12,5 3 36,25	216,396
	1323	Pos.	57·14 133·30 59·40 131·30	95·220 96·350 95·350	95·785 95·850	95·817	at div. 95 11 50 16 53 56 57 29	at div. 100 11 50 25 53 47 57 38,5	by div. 95 7 13,0 3 36,50	by div. 100 7 13,5 3 36,75	216,541
T=35·86 B=29·236	1324	Neg.	131·30 54·00 129·20 56·80	92·650 91·600 93·000	92·125 92·300	92·212	at div. 90 0 1 11,5 4 41 8 24,5	at div. 95 0 1 2,5 4 50 8 15	by div. 90 7 13,0 3 36,50	by div. 95 7 12,5 3 36,25	216,389
Dec. 20 T=35·37 B=29·248	1325	Pos.	84·18 119·40 85·30 118·40	101·790 102·350 101·850	102·070 102·100	102·085	at div. 100 9 40 24,5 44 20 47 40,5	at div. 105 9 40 45 43 59 48 2	by dir. 100 7 16,0 3 38,0	by div. 105 7 17,0 3 38,5	218,208
Continued.	1326	Neg.	118·40 78·80 117·16 79·02	98·600 97·980 98·090	98·290 98·035	98·162	at div. 95 9 51 42 54 57 58 59,5	at div. 100 9 51 24 55 15 58 40,5	by div. 95 7 17,5 3 38,75	by div. 100 7 16,5 3 38,25	218,434

27th Series cont.—1½-inch *Platina* balls, with *single* copper wire; diameter = 0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times. h m s	Observed Times. h m s	2 N m s	2 N m s	N for Mean Resting Point.
Continued.	1327	Pos.	79·02 123·60 81·22 122·30	101·310 101·410 101·760	101·860 102·085	101·972	at div. 100 10 2 22 6 14 9 39	at div. 105 10 2 38 5 58 9 56	by div. 100 7 17,0 3 38,5	by div. 105 7 18, 3 39,0	* 218,697
	1328	Neg.	122·30 74·58 120·80 74·66	98·440 97·690 97·730	98·065 97·710	97·887	at div. 95 10 13 36 16 57 20 54,5	at div. 100 10 13 21 17 12 20 39	by div. 95 7 18,5 3 39,25	by div. 100 7 18,0 3 39,00	219,106
	1329	Pos.	74·66 126·84 77·22 125·30	100·750 102·030 101·260	101·390 101·645	101·517	at div. 100 10 24 24 28 13 31 43,5	at div. 105 10 24 38 27 59 31 58	by div. 100 7 19,5 3 39,75	by div. 105 7 20,0 3 40,00	219,826
	1330	Neg.	125·30 70·90 123·54 72·32	98·100 97·220 97·930	97·660 97·575	97·617	at div. 95 10 35 35,5 39 2 42 55,5	at div. 100 10 35 22,5 39 15 42 41,5	by div. 95 7 20,0 3 40,00	by div. 100 7 19,0 3 39,50	219,738
	1331	Pos.	72·32 129·70 74·00 127·92	101·010 101·850 100·960	101·430 101·405	101·417	at div. 100 10 46 27 50 14 53 47	at div. 105 10 46 39 50 1 54 0	by div. 100 7 20,0 3 40,0	by div. 105 7 21,0 3 40,5	220,142
	1332	Neg.	127·92 67·88 126·00 69·80	97·900 96·940 97·900	97·420 97·420	97·420	at div. 95 10 57 38 11 1 7 4 59,5	at div. 100 10 57 26,5 11 1 19,5 4 47	by div. 95 7 21,5 3 40,75	by div. 100 7 20,5 3 40,25	220,508
	1333	Pos.	69·80 132·00 71·90 130·20	100·900 101·950 101·050	101·425 101·500	101·462	at div. 100 11 8 33 12 19 15 53	at div. 105 11 8 44 12 7,5 16 5	by div. 100 7 20,0 3 40,0	by div. 105 7 21,0 3 40,5	220,146
	1334	Neg.	130·20 66·00 128·22 68·00	98·100 97·110 98·110	97·605 97·610	97·607	at div. 95 11 19 45 23 14,5 27 8	at div. 100 11 19 34 23 26 26 56	by div. 95 7 23,0 3 41,5	by div. 100 7 22,0 3 41,0	221,239
	1335	Pos.	68·00 134·42 70·38 132·60	101·210 102·400 101·490	101·805 101·945	101·875	at div. 100 11 30 41,5 34 31 38 4	at div. 105 11 30 52 34 20 38 15,5	by div. 100 7 22,5 3 41,25	by div. 105 7 23,5 3 41,75	221,437
T = 35·77 B = 29·272	1336	Neg.	132·60 64·76 130·48 66·92	98·680 97·620 98·700	98·150 98·160	98·155	at div. 95 11 41 59 missed. 49 23	at div. 100 11 41 48,5 missed. 49 12	by div. 95 7 24,0 3 42,00	by div. 100 7 23,5 3 41,75	221,842

28th Series.—2-inch *Zinc* balls, with *single* copper wire; diameter = ·0219 inch.

Dec. 21 T = 35·33 B = 29·640 Continued.	1337	Pos.	92·68 115·30 93·60 115·10	103·990 104·450 104·350	104·220 104·400	104·310	at div. 104 9 43 25 46 46 50 1	at div. 106 9 43 36,5 46 34,5 50 13	by div. 104 6 36,0 3 18,00	by div. 106 6 36,5 3 18,25	198,040

28th Series cont.—2-inch *Zinc* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1338	Neg.	115·10 87·60 113·80 88·68	101·350 100·700 101·240	101·025 100·970	100·997	at div. 100 9 53 32 56 41 10 0 10	at div. 102 9 53 22,5 56 52 10 0 0	by div. 100 6 38,0 3 19,00	by div. 102 6 37,5 3 18,75	198,875
	1339	Pos.	88·68 118·92 89·94 117·64	103·800 104·430 103·790	104·115 104·110	104·112	at div. 100 10 3 12 7 7 9 48,5	at div. 105 10 3 33 6 44,5 10 11,5	by div. 100 6 36,5 3 18,25	by div. 105 6 38,5 3 19,25	199,061
	1340	Neg.	117·64 84·30 116·08 85·30	100·970 100·190 100·690	100·580 100·440	100·510	at div. 100 10 13 32 16 48 20 11	at div. 105 10 13 12,5 17 8 19 49,5	by div. 100 6 39,0 3 19,5	by div. 105 6 37,0 3 18,5	199,398
	1341	Pos.	85·30 121·30 86·40 120·00	103·300 103·850 103·200	103·575 103·525	103·550	at div. 100 10 23 18,5 27 4 29 58	at div. 105 10 23 36 26 46 30 17	by div. 100 6 39,5 3 19,75	by div. 105 6 41,0 3 20,50	200,282
	1342	Neg.	120·00 81·00 118·52 82·00	100·500 99·760 100·260	100·130 100·010	100·070	at div. 100 10 33 34 36 54 40 14,5	at div. 105 10 33 17 37 11 39 56,5	by div. 100 6 40,5 3 20,25	by div. 105 6 39,5 3 19,75	200,243
	1343	Pos.	82·00 123·26 83·14 121·72	102·630 103·200 102·430	102·915 102·815	102·865	at div. 100 10 43 28 47 7 50 9,5	at div. 105 10 43 44 46 51 50 26	by div. 100 6 41,5 3 20,75	by div. 105 6 42,0 3 21,00	200,893
T=35·51 B=29·650	1344	Neg.	121·72 77·92 119·82 79·32	99·820 98·870 99·570	99·345 99·220	99·282	at div. 95 10 53 54 56 49,5 11 0 37	at div. 100 10 53 39,5 57 5 11 0 21	by div. 95 6 43,0 3 21,50	by div. 100 6 41,5 3 20,75	200,858
Dec. 22 T=35·50 B=29·786	1345	Pos.	52·40 127·00 55·50 124·20	89·700 91·250 89·850	90·475 90·550	90·512	at div. 90 9 59 8 10 2 29 5 47	at div. 95 9 59 16,5 10 2 20,5 5 56,5	by div. 90 6 39,0 3 19,5	by div. 95 6 40,0 3 20,0	199,551
	1346	Neg.	124·20 51·76 121·42 54·40	87·980 86·590 87·910	87·285 87·250	87·267	at div. 85 10 9 12,5 12 24 15 52,5	at div. 90 10 9 4 12 33,5 15 43	by div. 85 6 40,0 3 20,0	by div. 90 6 39,0 3 19,5	199,773
	1347	Pos.	54·40 125·20 57·06 122·64	89·800 91·130 89·850	90·465 90·490	90·477	at div. 90 10 19 8 22 29,5 25 47	at div. 95 10 19 17 22 20 25 57	by div. 90 6 39,0 3 19,5	by div. 95 6 40,0 3 20,0	199,548
	1348	Neg.	122·64 53·12 119·90 55·62	87·880 86·510 87·760	87·195 87·135	87·165	at div. 85 10 29 13 32 25 35 52	at div. 90 10 29 4 32 34,5 35 42,5	by div. 85 6 39,0 3 19,50	by div. 90 6 38,5 3 19,25	199,392
Continued.	1349	Pos.	55·62 124·00 57·24 120·98	89·810 90·620 89·110	90·215 89·865	90·040	at div. 90 10 39 9 42 30,5 45 52	at div. 95 10 39 18 42 20,5 46 2	by div. 90 6 43,0 3 21,5	by div. 95 6 44,0 3 22,0	201,504

28th Series cont.—2-inch *Zinc* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1350	Neg.	120·98 53·00 118·18 55·40	86·990 85·590 86·790	86·290 86·190	86·240	at div. 85 10 49 15 52 31 55 55,5	at div. 90 10 49 5,5 52 40,5 55 45	by div. 85 6 40,5 3 20,25	by div. 90 6 39,5 3 19,75	* 200,126
	1351	Pos.	55·40 122·48 58·20 119·30	88·940 90·340 88·750	89·640 89·545	89·592	at div. 85 10 59 6 11 2 44,5 5 46	at div. 90 10 59 15,5 11 2 34,5 5 56,5	by div. 85 6 40,0 3 20,0	by div. 90 6 41,0 3 20,5	200,459
	1352	Neg.	119·30 54·10 116·74 56·32	86·700 85·420 86·530	86·060 85·975	86·017	at div. 85 11 9 19 12 35 15 59,5	at div. 90 11 9 9,5 12 45 15 49	by div. 85 6 40,5 3 20,25	by div. 90 6 30,5 3 19,75	200,148
	1353	Pos.	56·32 121·68 58·10 119·30	89·000 89·890 88·700	89·445 89·295	89·370	at div. 85 11 19 10 22 47,5 25 50,5	at div. 90 11 19 20 22 37,5 26 1	by div. 85 6 40,5 3 20,25	by div. 90 6 41,0 3 20,50	200,468
	1354	Neg.	119·30 53·38 116·32 55·20	86·340 84·850 85·760	85·595 85·305	85·450	at div. 85 11 29 22 32 40,5 36 2	at div. 90 11 29 12 32 50,5 35 51,5	by div. 85 6 40,0 3 20,00	by div. 90 6 39,5 3 19,75	199,978
	1355	Pos.	55·20 120·60 57·48 118·54	87·900 89·040 88·010	88·470 88·525	88·497	at div. 85 11 39 16,5 42 51 45 57,5	at div. 90 11 39 26 42 41 46 8	by div. 85 6 41,0 3 20,5	by div. 90 6 42,0 3 21,0	200,850
T = 35·71 B = 29·792	1356	Neg.	118·54 53·12 116·22 55·48	85·830 84·670 85·850	85·250 85·260	85·255	at div. 85 11 49 28 52 49 56 11,5	at div. 90 11 49 18,5 52 59 56 1	by div. 85 6 43,5 3 21,75	by div. 90 6 42,5 3 21,25	201,737

29th Series.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·367 inch.

Dec. 24 T = 39·95 B = 30·046	1357	Pos.	99·12 119·40 99·68 118·36	109·260 109·540 109·020	109·400 109·280	109·340	at div. 109 9 47 50 52 0 55 59,5	at div. 110 9 47 58 51 52 56 8	by div. 109 8 9,5 4 4,75	by div. 110 8 10,0 4 5,00	244,835
	1358	Neg.	118·36 91·00 117·06 91·98	104·680 104·030 104·520	104·355 104·275	104·315	at div. 104 10 0 11,5 4 11,5 8 18	at div. 105 10 0 6 4 17,5 8 12	by div. 104 8 6,5 4 3,25	by div. 105 8 6,0 4 3,00	243,171
	1359	Pos.	91·98 124·86 91·60 123·06	108·420 108·230 107·330	108·325 107·780	108·052	at div. 105 10 12 4,5 16 38 20 15	at div. 110 10 12 28 16 15 20 39,5	by div. 105 8 10,5 4 5,25	by div. 110 8 11,5 4 5,75	245,555
Continued.	1360	Neg.	123·06 82·80 121·32 84·50	102·930 102·060 102·910	102·495 102·485	102·490	at div. 100 10 24 43,5 28 28,5 32 54,5	at div. 105 10 24 24 28 49 32 33,5	by div. 100 8 11,0 4 5,50	by div. 105 8 9,5 4 4,75	245,127

29th SERIES continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1361	Pos.	84·50 129·50 86·92 127·92	107 000 108·210 107·420	107·605 107·815	107·710	at div. 105 10 36 44 41 10 44 56	at div. 110 10 37 1,5 40 51,5 45 15	by div. 105 8 12,0 4 6,00	by div. 110 8 13,5 4 6,75	* 246,406
	1362	Neg.	127·92 79·72 126·32 82·18	103·820 103·020 104·250	103·420 103·635	103·527	at div. 100 10 49 27,5 53 12,5 58 45	at div. 105 10 49 11 53 29,5 57 27,5	by div. 100 8 17,5 4 8,75	by div. 105 8 16,5 4 8,25	248,397
	1363	Pos.	82·18 134·52 84·72 132·80	108·350 109·620 108·760	108·985 109·190	109·087	at div. 105 11 1 30 6 1 9 41	at div. 110 11 1 45 5 45 9 57	by div. 105 8 11,0 4 5,5	by div. 110 8 12,0 4 6,0	245,909
T = 40·25 B = 30·030	1364	Neg.	132·80 77·54 130·94 80·08	105·170 104·240 105·510	104·705 104·875	104·790	at div. 100 11 14 17 17 57 22 34	at div. 105 11 14 2,5 18 11,5 22 18,5	by div. 100 8 17,0 4 8,5	by div. 105 8 16,0 4 8,0	248,021
Dec. 26 T = 44·43 B = 29·840	1365	Pos.	89·56 122·10 91·00 120·90	105·830 106·550 105·950	106·190 106·250	106·220	at div. 105 10 0 54 5 1 8 45,5	at div. 110 10 1 17 4 36,5 9 11	by div. 105 7 51,5 3 55,75	by div. 110 7 54,0 3 57,00	236,055
	1366	Neg.	120·90 83·70 119·00 85·20	102·300 101·350 102·100	101·825 101·725	101·775	at div. 100 10 13 0 16 41,5 20 53	at div. 105 10 12 39,5 17 3 20 30,5	by div. 100 7 53,0 3 56,5	by div. 105 7 51,0 3 55,5	236,145
	1367	Pos.	85·20 126·26 86·98 124·70	105·730 106·620 105·840	106·175 106·230	106·202	at div. 105 10 24 40,5 28 46 32 32	at div. 110 10 24 59 28 26 32 52	by div. 105 7 51,5 3 55,75	by div. 110 7 53,0 3 56,50	235,930
	1368	Neg.	124·70 79·80 122·74 81·36	102·250 101·270 102·050	101·760 101·660	101·720	at div. 100 10 36 41,5 40 25,5 44 33,5	at div. 105 10 36 24,5 40 43 44 15	by div. 100 7 52,0 3 36,00	by div. 105 7 50,5 3 35,25	235,742
	1369	Pos.	81·36 129·68 83·22 127·46	105·520 106·450 105·340	105·985 105·895	105·940	at div. 105 10 48 23 52 26,5 56 16,5	at div. 110 10 48 39,5 52 10 56 34	by div. 105 7 53,5 3 56,75	by div. 110 7 54,5 3 57,25	236,844
	1370	Neg.	127·46 76·00 125·72 77·52	101·730 100·860 101·620	101·295 101·240	101·267	at div. 100 11 0 21,5 4 9 8 14,5	at div. 105 11 0 7 4 24 7 59	by div. 100 7 53,0 3 56,5	by div. 105 7 52,0 3 56,0	236,373
	1371	Pos.	77·52 132·24 79·80 130·20	104·880 106·020 105·000	105·450 105·510	105·480	at div. 105 11 12 9 16 22,5 20 1,5	at div. 110 11 12 23 16 8 20 16,5	by div. 105 7 52,5 3 56,25	by div. 110 7 53,5 3 56,75	236,298
Continued.	1372	Neg.	130·20 73·60 125·38 75·30	101·900 99·490 100·340	100·695 99·915	100·305	at div. 100 11 23 55,5 missed. 31 52	at div. 105 11 23 41 missed. 31 37	by div. 100 7 56,5 3 58,25	by div. 105 7 56,0 3 58,00	238,235

29th Series continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1373	Pos.	75·30 131·80 77·82 128·90	103·550 104·810 103·360	104·180 104·085	104·132	at div. 100 11 35 42 40 3,5 43 37,5	at div. 105 11 35 55,5 39 49 43 52	by div. 100 7 55,5 3 57,75	by div. 105 7 56,5 3 58,25	s 238,163
	1374	Neg.	128·90 71·20 126·02 73·80	100·050 98·610 99·910	99·330 99·260	99·295	at div. 95 11 48 1 51 35,5 55 58,5	at div. 100 11 47 47,5 51 49,5 55 44	by div. 95 7 57,5 3 58,75	by div. 100 7 56,5 3 58,25	238,321
	1375	Pos.	73·80 132·54 76·92 130·00	103·170 104·730 103·460	103·950 104·095	104·022	at div. 100 11 59 36,5 0 3 57 7 33	at div. 105 11 59 49,5 0 3 43,5 7 47,5	by div. 100 7 56,5 3 58,25	by div. 105 7 58,0 3 59,00	238,853
T = 44·53 B = 29·850	1376	Neg.	130·00 70·50 127·28 73·46	100·250 98·890 100·370	99·570 99·630	99·600	at div. 95 0 11 58 15 35 20 2	at div. 100 0 11 45 15 48,5 19 47,5	by div. 95 8 4,0 4 2,00	by div. 100 8 2,5 4 1,25	241,310
Dec. 27 T = 42·28 B = 30·148	1377	Pos.	91·90 117·20 93·00 115·92	104·550 105·100 104·460	104·825 104·780	104·802	at div. 100 9 51 5,5 56 5,5 59 1	at div. 105 9 51 36,5 55 33 59 35,5	by div. 100 7 55,5 3 57,75	by div. 105 7 59,0 3 59,50	239,431
	1378	Neg.	115·92 84·96 114·28 86·30	100·440 99·620 100·290	100·030 99·955	99·992	at div. 95 10 4 2 7 10,5 12 5	at div. 100 10 3 36,5 7 37 11 36,5	by div. 95 8 3,0 4 1,5	by div. 100 8 0,0 4 0,0	240,002
	1379	Pos.	86·30 121·74 87·90 119·84	104·020 104·820 103·870	104·420 104·345	104·382	at div. 100 10 15 21,5 20 0 23 20	at div. 105 10 15 43 19 37 23 44	by div. 100 7 58,5 3 59,25	by div. 105 8 1,0 4 0,50	240,345
	1380	Neg.	119·84 80·46 117·80 82·08	100·150 99·130 99·940	99·640 99·535	99·587	at div. 95 10 28 0 31 22,5 35 59,5	at div. 100 10 27 40,5 31 43 35 38	by div. 95 7 59,5 3 59,75	by div. 100 7 57,5 3 58,75	238,833
	1381	Pos.	82·08 124·80 83·98 122·74	103·440 104·390 103·360	103·915 103·875	103·895	at div. 100 10 39 28 43 55 47 23,5	at div. 105 10 39 46 43 36 47 43	by div. 100 7 55,5 3 57,75	by div. 105 7 57,0 3 58,50	238,334
	1382	Neg.	122·74 76·96 120·60 78·92	99·850 98·780 99·760	99·315 99·270	99·292	at div. 95 10 51 52,5 55 21 59 48,5	at div. 100 10 51 35,5 55 39 59 30	by div. 95 7 56,0 3 58,00	by div. 100 7 54,5 3 57,25	237,356
	1383	Pos.	78·92 127·40 81·20 125·48	103·160 104·300 103·340	103·730 103·820	103·775	at div. 100 11 3 20,5 7 41 11 12	at div. 105 11 3 36 7 25 11 29	by div. 100 7 51,5 3 55,75	by div. 105 7 53,0 3 56,50	236,316
Continued.	1384	Neg.	125·48 74·52 123·50 76·80	100·000 99·010 100·150	99·505 99·580	99·542	at div. 95 11 15 36,5 19 5,5 23 31	at div. 100 11 15 21,5 19 21 23 14,5	by div. 95 7 54,5 3 57,25	by div. 100 7 53,0 3 56,50	236,569

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29th Series continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1385	Pos.	76·80 130·60 79·00 128·90	103·700 104·800 103·950	104·250 104·375	104·312	at div. 100 11 27 2,5 31 23 34 52,5	at div. 105 11 27 17 31 8,5 35 8	by div. 100 7 50,0 3 55,0	by div. 105 7 51,0 3 55,5	* 235,431
T=42·35 B=30·150	1386	Neg.	128·90 72·12 127·08 74·50	100·510 99·600 100·790	100·055 100·195	100·125	at div. 100 11 39 4,5 43 0 46 58	at div. 105 11 38 51 43 14 46 44	by div. 100 7 53,5 3 56,75	by div. 105 7 53,0 3 56,50	236,744
Dec. 28 T=41·28 B=30·100	1387	Pos.	91·30 116·72 92·54 115·80	104·010 104·630 104·170	104·320 104·400	104·360	at div. 104 9 54 50 58 53 10 2 48	at div. 106 9 55 2 58 40 10 3 1	by div. 104 7 58,0 3 59,0	by div. 106 7 59,0 3 59,5	239,090
	1388	Neg.	115·80 84·58 114·70 85·50	100·190 99·640 100·100	99·915 99·870	99·892	at div. 98 10 7 2 10 43,5 14 3,5	at div. 100 10 6 52 10 54 14 53	by div. 98 8 1,5 4 0,75	by div. 100 8 1,0 4 0,50	240,514
	1389	Pos.	85·50 122·30 87·12 120·80	103·900 104·710 103·960	104·305 104·335	104·320	at div. 100 10 18 41 23 20 26 43,5	at div. 105 10 19 2 22 58 27 7	by div. 100 8 2,5 4 1,25	by div. 105 8 5,0 4 2,50	242,330
	1390	Neg.	120·80 79·34 118·84 80·88	100·070 99·090 99·860	99·580 99·475	99·527	at div. 95 10 31 26 34 54 39 33	at div. 100 10 31 7 35 13,5 39 12	by div. 95 8 7,0 4 3,5	by div. 100 8 5,0 4 2,5	242,595
	1391	Pos.	80·88 126·20 82·30 123·74	103·540 104·250 103·020	103·895 103·635	103·765	at div. 100 10 43 7 47 38,5 51 16	at div. 105 10 43 24,5 47 20,5 51 35	by div. 100 8 9,0 4 4,50	by div. 105 8 10,5 4 5,25	245,065
	1392	Neg.	123·74 74·74 121·30 76·80	99·240 98·020 99·050	98·630 98·535	98·582	at div. 95 10 55 47 59 28 11 3 57	at div. 100 10 55 31 59 45 11 3 39	by div. 95 8 10,0 4 5,0	by div. 100 8 8,0 4 4,0	244,284
	1393	Pos.	76·80 128·50 78·80 126·00	102·650 103·650 102·400	103·150 103·025	103·087	at div. 100 11 7 40 12 4 15 50	at div. 105 11 7 55 11 48,5 16 7	by div. 100 8 10,0 4 5,0	by div. 105 8 12,0 4 6,0	245,617
	1394	Neg.	126·00 71·50 123·20 74·28	98·750 97·350 98·740	98·050 98·045	98·047	at div. 95 11 20 17 24 5 28 31	at div. 100 11 20 2,5 24 20 28 15	by div. 95 8 14,0 4 7,00	by div. 100 8 12,5 4 6,25	246,543
	1395	Pos.	74·28 130·20 77·56 127·46	102·240 103·880 102·510	103·060 103·195	103·127	at div. 100 11 32 22 36 47 40 35,5	at div. 105 11 32 36,5 36 32 40 51,5	by div. 100 8 13,5 4 6,75	by div. 105 8 15,0 4 7,50	247,219
T=41·55 B=30·100	1396	Neg.	127·46 70·08 124·48 74·10	98·770 97·280 99·290	98·025 98·285	98·155	at div. 95 11 45 5 48 53,5 53 23,5	at div. 100 11 44 51 49 8,5 53 8	by div. 95 8 18,5 4 9,25	by div. 100 8 17,0 4 8,50	248,777

30th Series.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Dec. 29 T=43·10 B=30·120	1397	Pos.	96·92 113·74 97·60 111·30	105·330 105·670 104·450	105·500 105·060	105·280	at div. 104 10 9 16 13 25 16 47	at div. 106 10 9 34 13 6 17 7,5	by div. 104 7 31,0 3 45,50	by div. 106 7 33,5 3 46,75	* 226,300
	1398	Neg.	111·30 90·38 109·c4 91·68	100·840 99·710 100·360	100·275 100·035	100·155	at div. 100 10 20 50 24 31 28 17,5	at div. 102 10 20 36 24 46 28 1	by div. 100 7 27,5 3 43,75	by div. 102 7 25,0 3 42,50	223,653
	1399	Pos.	91·68 114·90 93·28 112·54	103·290 104·090 102·910	103·690 103·500	103·595	at div. 100 10 31 46 36 22 39 19	at div. 105 10 32 17 35 48 39 58	by div. 100 7 33,0 3 46,5	by div. 105 7 41,0 3 50,5	229,376
	1400	Neg.	112·54 87·00 110·26 88·98	99·770 98·630 99·620	99·200 99·125	99·162	at div. 95 10 44 4 47 2 51 46	at div. 100 10 43 34,5 47 27 51 10,5	by div. 95 7 42,0 3 51,0	by div. 100 7 36,0 3 48,0	228,503
	1401	Pos.	88·98 116·08 91·40 114·00	102·530 103·740 102·700	103·135 103·220	103·177	at div. 100 10 54 52,5 59 19 11 2 29	at div. 105 10 55 19,5 58 49 11 3 2	by div. 100 7 36,5 3 48,25	by div. 105 7 42,5 3 51,25	230,156
	1402	Neg.	114·00 85·70 111·90 88·48	99·850 98·800 100·190	99·325 99·495	99·410	at div. 95 11 7 9 10 13 15 0	at div. 100 11 6 42 10 41 14 27	by div. 95 7 51,0 3 55,5	by div. 100 7 45,0 3 52,5	232,854
	1403	Pos.	88·48 118·14 91·82 116·28	103·310 104·980 104·050	104·145 104·515	104·330	at div. 100 11 18 6,5 22 45 25 44,5	at div. 105 11 18 32 22 16 26 15,5	by div. 100 7 38,0 3 49,00	by div. 105 7 43,5 3 51,75	231,381
	1404	Neg.	116·28 86·60 114·26 90·00	101·440 100·430 102·130	100·935 101·280	101·107	at div. 100 11 30 13 33 56,5 37 4,5	at div. 105 11 29 48 34 24 37 34	by div. 100 7 51,5 3 55,75	by div. 105 7 46,0 3 53,00	234,941
	1405	Pos.	90·00 120·60 93·00 118·32	105·300 106·800 105·660	106·050 106·230	106·140	at div. 105 11 41 48 45 51 49 28	at div. 110 11 42 13 45 24 49 58	by div. 105 7 40,0 3 50,0	by div. 110 7 45,0 3 52,5	230,570
T=43·51 B=30·100	1406	Neg.	118·32 87·34 116·10 89·90	102·830 101·720 103·000	102·275 102·360	102·317	at div. 100 11 53 39 57 7 0 1 23	at div. 105 11 53 15 57 23 0 0 55	by div. 100 7 44,0 3 52,0	by div. 105 7 40,0 3 50,0	231,073
Dec. 30 T=44·78 B=30·142	1407	Pos.	91·00 117·10 93·30 115·70	104·050 105·200 104·500	104·625 104·850	104·737	at div. 100 9 51 7,5 55 44 58 24,5	at div. 105 9 51 35,5 55 14 58 57,5	by div. 100 7 17,0 3 38,5	by div. 105 7 22,0 3 41,0	220,868
Continued.	1408	Neg.	115·70 87·80 114·00 90·30	101·750 100·900 102·150	101·325 101·525	101·425	at div. 100 10 2 47 6 15,5 10 15	at div. 105 10 2 21,5 6 43 9 45	by div. 100 7 28,0 3 44,00	by div. 105 7 23,5 3 41,75	223,359

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1409	Pos.	90·30 119·80 92·90 117·30	105·050 106·350 105·100	105·700 105·725	105·712	at div. 105 10 13 46,5 17 34 21 8,5	at div. 110 10 14 11 17 7 21 38	by div. 105 7 22,0 3 41,0	by div. 110 7 27,0 3 43,5	221,356
	1410	Neg.	117·30 87·60 115·22 89·88	102·450 101·410 102·550	101·930 101·980	101·955	at div. 100 10 25 4 28 26 32 29	at div. 105 10 24 40 28 52 32 0	by div. 100 7 25,0 3 42,5	by div. 105 7 20,0 3 40,0	221,525
	1411	Pos.	89·88 120·40 91·92 118·00	105·140 106·160 104·960	105·650 105·560	105·605	at div. 105 10 35 59,5 39 47 43 25	at div. 110 10 36 23,5 39 22 43 53,5	by div. 105 7 25,5 3 42,75	by div. 110 7 30,0 3 45,00	223,022
	1412	Neg.	118·00 87·22 114·22 88·80	102·610 100·720 101·510	101·665 101·115	101·390	at div. 100 10 47 27 50 55 54 49	at div. 105 10 47 2,5 51 21,5 54 20,5	by div. 100 7 22,0 3 41,0	by div. 105 7 18,0 3 39,0	220,444
	1413	Pos.	88·80 119·38 90·70 115·10	104·090 105·040 102·900	104·565 103·970	104·267	at div. 100 10 58 6 11 2 35 5 38	at div. 105 10 58 30 11 2 9 6 7	by div. 100 7 32,0 3 46,0	by div. 105 7 37,0 3 48,5	228,133
	1414	Neg.	115·10 84·16 111·42 85·52	99·630 97·790 98·470	98·710 98·130	98·420	at div. 95 11 10 7 13 15,5 17 36	at div. 100 11 9 43,5 13 41,5 17 8	by div. 95 7 29,0 3 44,50	by div. 100 7 24,5 3 42,25	222,961
	1415	Pos.	85·52 117·54 88·10 115·48	101·530 102·820 101·790	102·175 102·305	102·240	at div. 100 11 21 1,5 25 12 28 38,5	at div. 105 11 21 24,5 24 47 29 6	by div. 100 7 37,0 3 48,50	by div. 105 7 41,5 3 50,75	229,008
T = 45·03 B = 30·140	1416	Neg.	115·48 82·80 113·30 85·48	99·140 98·050 99·390	98·595 98·720	98·657	at div. 95 11 33 0 36 16 40 45	at div. 100 11 32 37 36 40,5 40 18	by div. 95 7 45,0 3 52,5	by div. 100 7 41,0 3 50,5	231,037
Dec. 31 T = 44·20 B = 30·260	1417	Pos.	84·58 130·40 87·86 127·76	107·490 109·130 107·810	108·310 108·470	108·390	at div. 105 9 44 56,5 48 48,5 51 57	at div. 110 9 45 11,5 48 31 52 14	by div. 105 7 0,5 3 30,25	by div. 110 7 2,5 3 31,25	210,928
	1418	Neg.	127·76 83·86 124·80 86·60	105·810 104·330 105·700	105·070 105·015	105·042	at div. 105 9 55 42,5 59 13,5 10 2 45	at div. 110 9 55 27 59 30 10 2 27	by div. 105 7 2,5 3 31,25	by div. 110 7 0,0 3 30,00	211,240
	1419	Pos.	86·60 129·06 89·40 126·60	107·830 109·230 108·000	108·530 108·615	108·572	at div. 105 10 6 6,5 10 1,5 13 8	at div. 110 10 6 23 9 44 13 26	by div. 105 7 1,5 3 30,75	by div. 110 7 3,0 3 31,50	211,286
Continued.	1420	Neg.	126·60 85·12 123·80 88·00	105·860 104·460 105·900	105·160 105·180	105·170	at div. 105 10 16 54 20 24,5 23 58	at div. 110 10 16 38 20 42 23 39	by div. 105 7 4,0 3 32,0	by div. 110 7 1,0 3 30,5	211,949

30th SERIES continued.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1421	Pos.	88·00 128·20 90·90 125·60	108·100 109·550 108·250	108·825 108·900	108·862	at div. 105 10 27 18 31 17 34 20	at div. 110 10 27 35 30 59 34 40	by div. 105 7 2,0 3 31,0	by div. 110 7 5,0 3 32,5	212,159
	1422	Neg.	125·60 86·52 122·58 88·90	106·060 104·550 105·740	105·305 105·145	105·225	at div. 105 10 38 10,5 41 41,5 45 15,5	at div. 110 10 37 53 42 1 44 55	by div. 105 7 5,0 3 32,5	by div. 110 7 2,0 3 31,0	212,433
	1423	Pos.	88·90 127·26 91·60 124·66	108·080 109·430 108·130	108·755 108·780	108·767	at div. 105 10 48 37,5 52 38 55 44	at div. 110 10 48 55 52 19 56 4,5	by div. 105 7 6,5 3 33,25	by div. 110 7 9,5 3 34,75	214,380
	1424	Neg.	124·66 86·48 121·86 88·74	105·570 104·170 105·300	104·870 104·735	104·802	at div. 100 10 59 53 11 2 52,5 7 6	at div. 105 10 59 35 11 3 12 6 45	by div. 100 7 13,0 3 36,5	by div. 105 7 10,0 3 35,0	215,059
	1425	Pos.	88·74 126·50 91·40 124·02	107·620 108·950 107·710	108·285 108·330	108·307	at div. 105 11 10 14 14 15 17 25,5	at div. 110 11 10 32 13 55 17 46,5	by div. 105 7 11,5 3 35,75	by div. 110 7 14.5 3 37,25	216,722
T=44·23 B=30·256	1426	Neg.	124·02 86·60 121·26 89·20	105·310 103·930 105·230	104·620 104·580	104·600	at div. 100 11 21 36,5 24 39 28 57	at div. 105 11 21 17 24 59 28 34	by div. 100 7 20.5 3 40,25	by div. 105 7 17,0 3 38,50	218,640

31st SERIES.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·367 inch.

1842. January 1 T=43·63 B=30·236	1427	Pos.	68·70 115·08 69·50 114·30	91·890 92·290 91·900	92·090 92·095	92·092	at div. 90 10 2 40,5 7 11,5 11 12	at div. 95 10 2 58 6 53,5 11 30	by div. 90 8 31,5 4 15,75	by div. 95 8 32,0 4 16,00	255,855
	1428	Neg.	114·30 59·54 113·28 60·40	86·920 86·410 86·840	86·665 86·625	86·645	at div. 85 10 15 43,5 19 46 24 15,5	at div. 90 10 15 29 20 3 24 0,5	by div. 85 8 32,0 4 16,00	by div. 90 8 31,5 4 15,75	255,918
	1429	Pos.	60·40 122·98 61·50 121·98	91·690 92·240 91·740	91·965 91·990	91·977	at div. 90 10 28 24 32 51 36 57	at div. 95 10 28 37 32 38 37 10,5	by div. 90 8 33,0 4 16,50	by div. 95 8 33,5 4 16,75	256,599
	1430	Neg.	121·98 51·90 120·62 53·00	86·940 86·260 86·810	86·600 86·535	86·567	at div. 85 10 41 24,5 45 33,5 49 58	at div. 90 10 41 13 45 45,5 49 46	by div. 85 8 33,5 4 16,75	by div. 90 8 33,0 4 16,50	256,672
Continued.	1431	Pos.	53·00 130·12 54·38 128·90	91·560 92·250 91·640	91·905 91·945	91·925	at div. 90 10 54 8,5 58 34 11 2 42,5	at div. 95 10 54 19 58 23 11 2 53,5	by div. 90 8 34,0 4 17,00	by div. 95 8 34,5 4 17,25	257,096

31st SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance =·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1432	Neg.	128·90 44·94 127·38 46·20	86·920 86·160 86·790	86·540 86·475	86·507	at div. 85 11 7 7,5 11 19 15 42	at div. 90 11 6 58 11 29 15 32	by div. 85 8 34,5 4 17,25	by div. 90 8 34,0 4 17,00	° 257,175
	1433	Pos.	46·20 136·72 47·86 135·22	91·460 92·290 91·540	91·875 91·915	91·895	at div. 90 11 19 55 24 20 28 30,5	at div. 95 11 20 4,5 24 10 28 40	by div. 90 8 35,5 4 17,75	by div. 95 8 35,5 4 17,75	257,750
T=43·73 B=30·232	1434	Neg.	135·22 38·54 133·48 40·12	86·880 86·010 86·800	86·445 86·405	86·425	at div. 85 11 32 56 37 9 41 32	at div. 90 11 32 47,5 37 18 41 23,5	by div. 85 8 36,0 4 18,0	by div. 90 8 36,0 4 18,0	258,000
Jan. 2 T=42·20 B=30·196	1435	Pos.	79·76 112·26 80·38 111·70	96·010 96·340 96·040	96·175 96·190	96·182	at div. 95 9 58 5 10 2 34 6 39	at div. 100 9 58 30 10 2 8 7 5	by div. 95 8 34,0 4 17,0	by div. 100 8 35,0 4 17,5	257,118
	1436	Neg.	111·70 70·20 110·82 70·82	90·950 90·510 90·820	90·730 90·665	90·697	at div. 90 10 11 8 15 20 19 42	at div. 95 10 10 48,5 15 40 19 22	by div. 90 8 34,0 4 17,00	by div. 95 8 33,5 4 16,75	256,965
	1437	Pos.	70·82 120·74 71·96 119·80	95·780 96·350 95·880	96·065 96·115	96·090	at div. 95 10 23 55 28 20 32 29	at div. 100 10 24 11,5 28 3 32 46	by div. 95 8 34,0 4 17,00	by div. 100 8 34,5 4 17,25	257,054
	1438	Neg.	119·80 62·12 118·70 63·00	90·960 90·410 90·850	90·685 90·630	90·657	at div. 90 10 36 55 41 8,5 45 29,5	at div. 95 10 36 41 41 23 45 15	by div. 90 8 34.5 4 17,25	by div. 95 8 34,0 4 17,00	257,217
	1439	Pos.	63·00 128·40 64·26 127·28	95·700 96·330 95·770	96·015 96·050	96·032	at div. 95 10 49 45 54 8 58 20	at div. 100 10 49 58 53 55,5 58 33,5	by div. 95 8 35,0 4 17,50	by div. 100 8 35,5 4 17,75	257,552
	1440	Neg.	127·28 54·52 126·04 55·72	90·900 90·280 90·880	90·590 90·580	90·585	at div. 90 11 2 44,5 6 58,5 11 19,5	at div. 95 11 2 33 7 10 11 7,5	by div. 90 8 35,0 4 17,50	by div. 95 8 34,5 4 17,25	257,471
	1441	Pos.	55·72 135·60 57·20 134·34	95·660 96·400 95·770	96·030 96·085	96·057	at div. 95 11 15 35,5 19 59 24 12,5	at div. 100 11 15 45,5 19 48 24 23	by div. 95 8 37,0 4 18,50	by div. 100 8 37,5 4 18,75	258,553
	1442	Neg.	134·34 47·42 132·50 48·42	90·880 89·960 90·460	90·420 90·210	90·315	at div. 90 11 28 36,5 32 54 37 14	at div. 95 11 28 27 33 4 37 4	by div. 90 8 37,5 4 18,75	by div. 95 8 37,0 4 18,50	258,734
Continued.	1443	Pos.	48·42 141·70 50·40 140·12	95·060 96·050 95·260	95·550 95·655	95·602	at div. 95 11 41 34,5 45 56 50 12	at div. 100 11 41 43,5 45 47 50 21,5	by div. 95 8 37,5 4 18,75	by div. 100 8 38,0 4 19,00	258,780

31st SERIES continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=42·31 B=30·160	1444	Neg.	140·12 41·42 138·28 42·90	90·770 89·850 90·590	90·310 90·220	90·265	at div. 90 11 54 53 58 51,5 0 3 11,5	at div. 95 11 54 25 59 0 0 3 3	by div. 90 8 38,5 4 19,25	by div. 95 8 38,0 4 19,00	* 259,237
Jan. 3 T=41·37 B=30·036	1445	Pos.	35·80 156·70 38·20 154·50	96·250 97·450 96·350	96·850 96·900	96·875	at div. 95 9 55 12 59 34 10 3 45	at div. 100 9 55 19 59 27,5 10 3 52	by div. 95 8 33,0 4 16,5	by div. 100 8 33,0 4 16,5	256,500
	1446	Neg.	154·50 29·92 151·94 32·00	92·210 90·930 91·970	91·570 91·450	91·510	at div. 90 10 8 9 12 21,5 16 42	at div. 95 10 8 2 12 28 16 35	by div. 90 8 33,0 4 16,5	by div. 95 8 33,0 4 16,5	256,500
	1447	Pos.	32·00 160·46 34·24 158·30	96·230 97·350 96·270	96·790 96·810	96·800	at div. 95 10 20 54,5 25 16,5 29 28	at div. 100 10 21 1 25 10 29 35	by div. 95 8 33,5 4 16,75	by div. 100 8 34,0 4 17,00	256,840
	1448	Neg.	158·30 25·80 155·90 28·02	92·050 90·850 91·960	91·450 91·405	91·427	at div. 90 10 33 49 38 2 42 22,5	at div. 95 10 33 42,5 38 8,5 42 16	by div. 90 8 33,5 4 16,75	by div. 95 8 33,5 4 16,75	256,750
	1449	Pos.	28·02 164·30 30·44 161·90	96·160 97·370 96·170	96·765 96·770	96·767	at div. 95 10 46 36,5 50 57 55 10	at div. 100 10 46 42 50 51 55 16	by div. 95 8 33,5 4 16,75	by div. 100 8 34,0 4 17,00	256,838
	1450	Neg.	161·90 22·30 159·30 24·70	92·100 90·800 92·000	91·450 91·400	91·425	at div. 90 10 59 31,5 11 3 45 8 5	at div. 95 10 59 26 11 3 52 7 59,5	by div. 90 8 33,5 4 16,75	by div. 95 8 33,5 4 16,75	256,750
	1451	Pos.	24·70 167·64 27·30 165·26	96·170 97·470 96·280	96·820 96·875	96·847	at div. 95 11 12 20,5 16 41,5 20 55	at div. 100 11 12 26 16 36 22 1	by div. 95 8 34,5 4 17,25	by div. 100 8 35,0 4 17,50	257,342
T=41·45 B=30·034	1452	Neg.	165·26 19·30 162·80 21·70	92·280 91·050 92·250	91·665 91·650	91·657	at div. 90 11 25 16,5 missed. 33 51	at div. 95 11 25 11 missed. 33 45	by div. 90 8 34,5 4 17,25	by div. 95 8 34,0 4 17,00	257,167
Jan. 4 T=37·95 B=29·950	1453	Pos.	90·40 125·02 91·20 124·14	107·710 108·110 107·670	107·910 107·890	107·900	at div. 106 10 7 58 12 42,5 16 28	at div. 108 10 8 7 12 33 16 38	by div. 106 8 30,0 4 15,0	by div. 108 4 31,0 4 15,5	255,475
	1454	Neg.	124·14 81·68 123·22 82·66	102·910 102·450 102·940	102·680 102·695	102·687	at div. 102 10 21 8,5 25 18 29 39	at div. 104 10 21 0,5 25 25,5 29 31	by div. 102 8 30,5 4 15,25	by div. 104 8 30,5 4 15,25	255,250
Continued.	1455	Pos.	82·66 132·68 84·20 131·52	107·670 108·440 107·860	108·055 108·150	108·102	at div. 105 10 33 44,5 38 20,5 42 13,5	at div. 110 10 34 1 38 3,5 42 31	by div. 105 8 29,0 4 14,5	by div. 110 8 30,0 4 15,0	254,810

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1456	Neg.	151·52 74·80 130·24 76·00	103·160 102·520 103·120	102·840 102·820	102·830	at div. 100 10 46 50,5 50 49 55 21,5	at div. 105 10 46 36 51 5,5 55 6,5	by div. 100 8 31,0 4 15,50	by div. 105 8 30,5 4 15,25	* 255,359
	1457	Pos.	76·00 139·68 77·30 138·52	107·840 108·490 107·910	108·165 108·200	108·182	at div. 105 10 59 22 11 3 54 7 52,5	at div. 110 10 59 35 11 5 41 8 6	by div. 105 8 30,5 4 15,25	by div. 110 8 31,0 4 15,50	255,409
	1458	Neg.	138·52 68·00 157·20 69·28	105·260 102·600 103·240	102·930 102·920	102·925	at div. 100 11 12 25,5 16 27 20 57	at div. 105 11 12 14 16 39 20 45	by div. 100 8 51,5 4 15,75	by div. 105 8 31,0 4 15,50	255,604
	1459	Pos.	69·28 146·80 70·52 145·50	108·040 108·660 108·010	108·550 108·555	108·342	at div. 105 11 25 0 29 40 33 30	at div. 110 11 25 10,5 29 29 33 41	by div. 105 8 30,0 4 15,00	by div. 110 8 30,5 4 15,25	255,167
T = 58·01 B = 29·960	1460	Neg.	145·50 61·28 144·12 62·40	103·540 102·650 105·260	102·995 102·955	102·975	at div. 100 11 58 0 42 4 46 51	at div. 105 11 37 50 42 14 46 21	by div. 100 8 31,0 4 15,5	by div. 105 8 31,0 4 15,5	255,500
Jan. 5 T = 57·03 B = 30·054	1461	Pos.	94·98 121·00 95·50 120·44	107·990 108·250 107·970	108·120 108·110	108·115	at div. 108 9 47 27 51 47,5 55 3,5	at div. 110 9 47 40 51 34,5 55 17	by div. 108 8 36,5 4 18,25	by div. 110 8 37,0 4 18,50	258,264
	1462	Neg.	120·44 85·50 119·72 86·06	102·870 102·510 102·890	102·690 102·700	102·695	at div. 102 10 0 29,5 4 41 9 7	at div. 104 10 0 20 4 50,5 8 57	by div. 102 8 37,5 4 18,75	by div. 104 8 57,0 4 18,50	258,665
	1463	Pos.	86·06 150·00 87·18 129·36	108·030 108·590 108·270	108·510 108·430	108·370	at div. 105 10 13 13 17 57,5 21 49	at div. 110 10 13 32 17 38 22 8,5	by div. 105 8 36,0 4 18,00	by div. 110 8 56,5 4 18,25	258,168
	1464	Neg.	129·36 77·20 128·42 78·08	103·280 102·810 103·250	103·045 105·050	103·057	at div. 100 10 26 33 50 31 35 10,5	at div. 105 10 26 17 30 47,5 34 54	by div. 100 8 37,5 4 18,75	by div. 105 8 57,0 4 18,50	258,597
	1465	Pos.	78·08 138·38 79·28 157·34	108·250 108·830 108·310	108·550 108·570	108·550	at div. 105 10 39 12,5 43 51,5 47 50,5	at div. 110 10 39 26 43 37,5 48 4,5	by div. 105 8 38,0 4 19,00	by div. 110 8 38,5 4 19,25	259,177
	1466	Neg.	137·54 69·46 156·06 70·62	103·400 102·760 103·340	103·080 103·050	103·065	at div. 100 10 52 29,5 56 34 11 1 9	at div. 105 10 52 17 56 46,5 11 0 56	by div. 100 8 39,5 4 19,75	by div. 105 8 39,0 4 19,50	258,597
Continued.	1467	Pos.	70·62 145·58 72·04 144·18	108·100 108·810 108·110	108·455 108·460	108·457	at div. 105 11 5 14,5 9 50 13 54,5	at div. 110 11 5 25,5 9 59,5 14 6	by div. 105 8 40,0 4 20,00	by div. 110 8 40,5 4 20,25	260,173

31st Series continued.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1468	Neg.	144·18 62·50 142·70 64·00	103·340 102·600 103·350	102·970 102·975	102·972	at div. 100 11 18 30 22 38 27 9	at div. 105 11 18 20 22 48 26 58,5	by div. 100 8 39,0 4 19,50	by div. 105 8 38,5 4 19,25	• 259,351
	1469	Pos.	64·00 152·20 65·60 150·80	108·100 108·900 108·200	108·500 108·550	108·525	at div. 105 11 31 19,5 35 52 39 59	at div. 110 11 31 29 35 42,5 40 8,5	by div. 105 8 39,5 4 19,75	by div. 110 8 39,5 4 19,75	259,750
T = 37·37 B = 30·050	1470	Neg.	150·80 56·22 149·06 57·94	103·510 102·640 103·500	103·075 103·070	103·072	at div. 100 11 44 33 48 42,5 53 14	at div. 105 11 44 24 48 51,5 53 5	by div. 100 8 41,0 4 20,5	by div. 105 8 41,0 4 20,5	260,500

32nd Series.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

Jan. 7 T = 36·91 B = 30·468	1471	Pos.	94·18 112·80 95·40 111·54	103·490 104·100 103·470	103·795 103·785	103·790	at div. 102 2 11 29 15 40 18 26,5	at div. 104 2 11 44 15 24 18 43,5	by div. 102 6 57,5 3 28,75	by div. 104 6 59,5 3 29,75	209,645
	1472	Neg.	111·54 89·72 109·80 90·80	100·630 99·760 100·300	100·195 100·030	100·112	at div. 100 2 22 33 26 3 29 34	at div. 102 2 22 20,5 26 16,5 29 19,5	by div. 100 7 1,0 3 30,5	by div. 102 6 59,0 3 29,5	210,444
	1473	Pos.	90·80 114·86 92·08 113·12	102·830 103·470 102·600	103·150 103·035	103·092	at div. 102 2 33 3 36 48 40 7	at div. 104 2 33 14,5 36 36 40 20,5	by div. 102 7 4,0 3 32,0	by div. 104 7 6,0 3 33,0	212,546
	1474	Neg.	113·12 86·64 110·92 87·80	99·880 98·780 99·360	99·330 99·070	99·200	at div. 98 2 43 56,5 47 15 50 59	at div. 100 2 43 46 47 26 50 47,5	by div. 98 7 2,5 3 31,25	by div. 100 7 1,5 3 30,75	210,950
	1475	Pos.	87·80 115·76 89·54 113·80	101·780 102·650 101·670	102·215 102·160	102·187	at div. 102 2 54 30 58 4,5 3 1 37	at div. 104 2 54 40 57 54,5 3 1 48,5	by div. 102 7 7,0 3 33,50	by div. 104 7 8,5 3 34,25	213,570
T = 37·00 B = 30·468	1476	Neg.	113·80 84·80 111·30 85·70	99·300 98·050 98·500	98·675 98·275	98·475	at div. 98 3 5 17,5 8 44 12 20,5	at div. 100 3 5 8 8 54,5 12 10	by div. 98 7 3,0 3 31,5	by div. 100 7 2,0 3 31,0	211,381
Jan. 12 T = 35·82 B = 30·060	1477	Pos.	94·80 112·30 96·28 111·24	103·550 104·290 103·760	103·920 104·025	103·972	at div. 102 9 51 30 55 44 58 48,5	at div. 104 9 51 46,5 55 26 59 8	by div. 102 7 18,5 3 39,25	by div. 104 7 21,5 3 40,75	220,729
Continued.	1478	Neg.	111·24 90·20 108·90 91·10	100·720 99·550 100·000	100·135 99·775	99·955	at div. 98 10 3 9,5 6 21 10 21	at div. 100 10 2 56 6 36 10 4,5	by div. 98 7 11,5 3 35,75	by div. 100 7 8,5 3 34,25	214,284

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1479	Pos.	91·10 114·40 93·60 112·20	102·750 104·000 102·900	103·375 103·450	103·412	at div. 102 10 14 1 18 2 21 27	at div. 104 10 14 13,5 17 48 21 42,5	by div. 102 7 26,0 3 43,0	by div. 104 7 29,0 3 44,5	224,059
	1480	Neg.	112·20 87·80 110·00 89·60	100·000 98·900 99·800	99·450 99·350	99·400	at div. 98 10 25 33 29 1 33 4	at div. 100 10 25 21,5 29 14 32 50	by div. 98 7 31,0 3 45,50	by div. 100 7 28,5 3 44,25	224,625
	1481	Pos.	89·60 115·32 91·46 113·00	102·460 103·390 102·230	102·925 102·810	102·867	at div. 102 10 36 38,5 40 34,5 44 10,5	at div. 104 10 36 50 40 21,5 44 23,5	by div. 102 7 32,0 3 46,00	by div. 104 7 33,5 3 46,75	226,325
T = 36·05 B = 30·064	1482	Neg.	113·00 85·06 110·76 87·26	99·030 97·910 99·010	98·470 98·460	98·465	at div. 98 10 48 6 51 49 55 41	at div. 100 10 47 55 52 0,5 55 28	by div. 98 7 35,0 3 47,5	by div. 100 7 33,0 3 46,5	227,268
			After the lapse of more than two hours I continued the experiments as follow.								
	1483	Pos.	87·54 105·88 90·46 105·50	96·710 98·170 97·980	97·440 98·075	97·757	at div. 96 1 19 56 24 1 27 4	at div. 98 1 20 11,5 23 43 27 23,5	by div. 96 7 8,0 3 34,0	by div. 98 7 12,0 3 36,0	215,757
	1484	Neg.	105·50 85·80 104·94 88·80	95·650 95·370 96·870	95·510 96·120	95·815	at div. 94 1 31 20 34 38,5 38 54	at div. 96 1 31 5,5 34 53 38 35,5	by div. 94 7 34,0 3 47,0	by div. 96 7 30,0 3 45,0	225,185
	1485	Pos.	88·80 111·70 91·82 110·80	100·250 101·760 101·310	101·005 101·535	101·270	at div. 100 1 42 13,5 46 7 49 26,5	at div. 102 1 42 26,5 45 53 49 41,5	by div. 100 7 13,0 3 36,5	by div. 102 7 15,0 3 37,5	217,135
	1486	Neg.	110·80 87·34 109·60 89·80	99·070 98·470 99·700	98·770 99·085	98·927	at div. 98 1 53 26,5 56 58,5 2 0 54	at div. 100 1 53 14,5 57 11 2 0 39,5	by div. 98 7 27,5 3 43,75	by div. 100 7 25,0 3 42,50	223,171
	1487	Pos.	89·80 115·50 92·60 113·80	102·650 104·050 103·200	103·350 103·625	103·487	at div. 102 2 4 24 8 21,5 11 44	at div. 104 2 4 35,5 8 9 11 57,5	by div. 102 7 20,0 3 40,0	by div. 104 7 22,0 3 41,0	220,743
T = 36·65 B = 30·040	1488	Neg.	113·80 87·48 111·58 89·70	100·640 99·530 100·640	100·085 100·085	100·085	at div. 100 2 15 40 19 24 23 8	at div. 102 2 15 29 19 36 22 55	by div. 100 7 28,0 3 44,0	by div. 102 7 26,0 3 43,0	223,958
Jan. 15 T = 36·93 B = 29·950 Continued.	1489	Pos.	94·50 113·00 96·10 111·80	103·750 104·550 103·950	104·150 104·250	104·200	at div. 104 9 49 36 53 15 56 53	at div. 106 9 49 51 52 59 57 11	by div. 104 7 17,0 3 38,5	by div. 106 7 20,0 3 40,0	218,650

32nd SERIES continued.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean	2nd Mean	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
					*		h m s	h m s	m s	m s	
Continued.	1490	Neg.	111·80 90·04 110·10 91·60	100·920 100·070 100·850	100·495 100·460	100·477	at div. 100 10 0 40 4 12 8 57,5	at div. 102 10 0 27 4 26 7 42	by div. 100 7 17,5 3 38,75	by div. 102 7 15,0 3 37,50	* 218,452
	1491	Pos.	91·60 115·84 93·30 113·90	103·720 104·570 103·600	104·145 104·085	104·115	at div. 104 10 11 37 15 17,5 18 56,5	at div. 106 10 11 48,5 15 5 19 10	by div. 104 7 19,5 3 39,75	by div. 106 7 21,5 3 40,75	219,807
	1492	Neg.	113·90 87·50 111·40 88·96	100·700 99·450 100·180	100·075 99·815	99·945	at div. 98 10 22 53 26 10,5 30 12	at div. 100 10 22 42,5 26 22,5 19 59	by div. 98 7 19,0 3 39,50	by div. 100 7 16,5 3 38,15	218,285
	1493	Pos.	88·96 116·88 90·76 112·00	102·920 103·820 101·380	103·370 102·600	102·985	at div. 102 10 33 37 37 32 41 11	at div. 104 10 33 47,5 37 21,5 41 24	by div. 102 7 34,0 3 47,00	by div. 104 7 36,5 3 48,25	227,615
	1494	Neg.	112·00 83·71 109·82 85·54	97·860 96·770 97·680	97·315 97·225	97·270	at div. 96 10 45 0 48 29 52 22	at div. 98 10 44 50 48 40 52 10,5	by div. 96 7 22,0 3 41,00	by div. 98 7 20,5 3 40,25	220,524
	1495	Pos.	85·54 115·60 87·50 113·60	100·570 101·550 100·550	101·060 101·050	101·055	at div. 100 10 55 53,5 59 46 11 3 19	at div. 102 10 56 3 59 35,5 11 3 30,5	by div. 100 7 25,5 3 42,75	by div. 102 7 27,5 3 43,75	223,277
	1496	Neg.	113·60 82·00 111·80 84·80	97·800 96·900 98·300	97·350 97·600	97·475	at div. 96 11 7 19 10 53,5 14 57,5	at div. 98 11 7 10 11 3 14 47	by div. 96 7 38,5 3 49,25	by div. 98 7 37,0 3 48,50	228,697
	1497	Pos.	84·80 117·74 87·52 116·00	101·270 102·630 101·760	101·950 102·195	102·072	at div. 102 11 18 39 22 25,5 26 12	at div. 104 11 18 48 22 16 26 22	by div. 102 7 33,0 3 46,5	by div. 104 7 34,0 3 47,0	226,518
	1498	Neg.	116·00 82·50 114·56 85·42	99·250 98·530 99·990	98·890 99·260	99·075	at div. 98 11 30 6 33 46 37 46	at div. 100 11 19 57,5 33 55,5 37 36	by div. 98 7 40,0 3 50,00	by div. 100 7 38,5 3 49,25	229,597
	1499	Pos.	85·42 120·84 88·76 118·92	103·130 104·800 103·840	103·965 104·320	104·142	at div. 104 11 41 31,5 45 19 49 6,5	at div. 106 11 41 40 45 10 49 16	by div. 104 7 35,0 3 47,5	by div. 106 7 36,0 3 48,0	127,535
T = 37·35 B = 19·974	1500	Neg.	118·92 84·00 116·74 87·30	101·460 100·370 102·020	100·915 101·195	101·055	at div. 100 11 53 5 56 46 0 0 49	at div. 102 11 52 57 56 55 0 0 39	by div. 100 7 44,0 3 51,0	by div. 102 7 42,0 3 51,0	231,473
Jan. 16 T = 37·00 B = 29·766 Continued.	1501	Pos.	96·70 116·00 98·10 114·80	106·350 107·050 106·450	106·700 106·750	106·725	at div. 106 10 13 32,5 18 21 20 48	at div. 108 10 13 47 17 6 21 4,5	by div. 106 7 15,5 3 37,75	by div. 108 7 17,5 3 38,75	218,112

32nd Series continued.—2-inch *Glass* balls, with bifilar *silk* lines ; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1502	Neg.	114·80 92·20 112·74 92·10	105·500 102·470 102·420	102·985 102·445	102·715	at div. 102 10 24 42 28 7 51 40	at div. 104 10 24 29,5 28 20 51 26,5	by div. 102 6 58,0 3 29,0	by div. 104 6 57,0 3 28,5	s 208,821
	1505	Pos.	92·10 117·80 95·58 115·00	104·950 105·690 104·290	105·320 104·990	105·155	at div. 104 10 55 15 39 6 42 55	at div. 106 10 55 26 38 54,5 42 46,5	by div. 104 7 18,0 5 59,00	by div. 106 7 20,5 3 40,25	219,722
	1504	Neg.	115·00 87·70 112·52 88·00	101·550 100·110 100·260	100·730 100·185	100·457	at div. 100 10 46 26 49 58 53 39	at div. 102 10 46 15,5 50 9 55 27	by div. 100 7 13,0 3 36,50	by div. 102 7 11,5 3 55,75	216,329
	1505	Pos.	88·00 116·70 90·10 115·50	102·350 103·400 102·700	102·875 103·050	102·962	at div. 102 10 57 21 11 1 11 4 42	at div. 104 10 57 31. 11 1 0 4 53,5	by div. 102 7 21,0 3 40,50	by div. 104 7 22,5 3 41,25	220,860
	1506	Neg.	115·30 84·68 115·50 87·40	99·990 99·090 100·450	99·540 99·770	99·655	at div. 98 11 8 41 12 11 16 12	at div. 100 11 8 31,5 12 21 16 1	by div. 98 7 31,0 5 45,50	by div. 100 7 29,5 3 44,75	224,880
	1507	Pos.	87·40 119·48 90·50 117·70	103·440 104·990 104·100	104·215 104·545	104·380	at div. 104 11 19 50,5 25 37,5 27 20	at div. 106 11 19 59,5 23 27,5 27 50,5	by div. 104 7 29,5 5 44,75	by div. 106 7 51,0 3 45,50	224,892
T = 57·31 B = 29·710	1508	Neg.	117·70 85·60 115·80 88·24	101·650 100·700 102·020	101·175 101·560	101·267	at div. 100 11 31 18 34 55,5 38 57	at div. 102 11 51 9 35 5,5 58 46	by div. 100 7 39,0 3 49,5	by div. 102 7 37,0 3 48,5	228,867

33rd Series.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

Jan. 17 T = 38·63 B = 30·080	1509	Pos.	95·88 108·60 97·90 107·42	102·240 103·250 102·660	102·745 102·955	102·850	at div. 102 9 51 15 54 57,5 57 58	at div. 104 9 51 36 54 33 58 26	by div. 102 6 43,0 3 21,5	by div. 104 6 50,0 3 25,0	202,987
	1510	Neg.	107·42 93·80 105·84 95·62	100·610 99·820 100·730	100·215 100·275	100·240	at div. 100 10 1 45,5 5 9 8 41,5	at div. 102 10 1 26 5 32 8 15,5	by div. 100 6 56,0 3 28,00	by div. 102 6 49,5 3 24,75	207,610
	1511	Pos.	95·62 110·60 97·84 109·00	103·110 104·220 103·420	103·665 103·820	105·742	at div. 102 10 11 55 15 53 18 59,5	at div. 104 10 12 12,5 15 32 19 3	by div. 102 6 44,5 5 22,25	by div. 104 6 50,5 3 25,25	204,863
Continued.	1512	Neg.	109·00 94·20 107·52 91·08	101·600 100·760 99·200	101·180 99·980	100·580	at div. 100 10 22 42 25 44 29 31,5	at div. 102 10 22 24,5 26 5 29 11,5	by div. 100 6 49,5 3 24,75	by div. 102 6 47,0 3 25,50	204,588

33rd Series continued.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1513	Pos.	91·08 111·72 93·04 108·70	101·400 102·380 100·870	101·890 101·625	101·757	at div. 100 10 33 5 37 0 40 5	at div. 102 10 33 18 36 45 40 22	by div. 100 7 0,0 3 30,0	by div. 102 7 4,0 3 32,0	211,757
	1514	Neg.	108·70 88·70 105·78 89·90	98·700 97·240 97·840	97·970 97·540	97·755	at div. 96 10 44 2 47 1 50 50	at div. 98 10 43 49 47 17 50 33	by div. 96 6 48,0 3 24,0	by div. 98 6 44,0 3 22,0	202,245
	1515	Pos.	89·90 109·28 91·66 106·84	99·590 100·470 99·250	100·030 99·860	99·945	at div. 98 10 53 57 57 55 11 0 54	at div. 100 10 54 11 57 39 11 1 12	by div. 98 6 57,0 3 28,5	by div. 100 7 1,0 3 30,5	210,445
	1516	Neg.	106·84 88·00 105·96 91·32	97·420 96·980 98·640	97·200 97·810	97·505	at div. 96 11 4 49 8 5,5 12 12	at div. 98 11 4 35 8 21 11 53	by div. 96 7 23,0 3 41,5	by div. 98 7 18,0 3 39,0	219,619
	1517	Pos.	91·32 111·30 94·40 110·12	101·310 102·850 102·260	102·080 102·555	102·317	at div. 102 11 15 31 19 7,5 22 34	at div. 104 11 15 45 18 51,5 22 51,5	by div. 102 7 3,0 3 31,50	by div. 104 7 6,5 3 33,25	211,777
	1518	Neg.	110·12 90·92 108·60 94·12	100·520 99·760 101·360	100·140 100·560	100·350	at div. 100 11 26 21 29 54 33 42	at div. 102 11 26 7 30 10 33 23	by div. 100 7 21,0 3 40,5	by div. 102 7 16,0 3 38,0	220,063
	1519	Pos.	94·12 113·56 97·26 111·20	103·840 105·410 104·230	104·625 104·820	104·722	at div. 104 11 37 14 41 4 44 32	at div. 106 11 37 29 40 47 44 52	by div. 104 7 18,0 3 39,0	by div. 106 7 23,0 3 41,5	219,902
T = 39·11 B = 30·110	1520	Neg.	111·20 93·08 108·50 95·90	102·140 100·790 102·200	101·465 101·595	101·530	at div. 100 11 48 36,5 51 53 56 7,5	at div. 102 11 48 20,5 52 12 55 45	by div. 100 7 31,0 3 45,50	by div. 102 7 24,5 3 42,25	223,015
Jan. 18 T = 38·51 B = 30·392	1521	Pos.	100·94 114·88 102·64 113·18	107·910 108·760 107·910	108·335 108·335	108·335	at div. 108 0 5 12,5 8 36 11 46,5	at div. 110 0 5 31 8 16 12 11	by div. 108 6 34,0 3 17,0	by div. 110 6 40,0 3 20,0	197,502
	1522	Neg.	113·18 98·10 111·06 99·50	105·640 104·580 105·280	105·110 104·930	105·020	at div. 104 0 15 21,5 18 21 21 56,5	at div. 106 0 15 5 18 39,5 21 34,5	by div. 104 6 35,0 3 17,50	by div. 106 6 29,5 3 14,75	196,098
	1523	Pos.	99·50 114·90 101·12 113·20	107·200 108·010 107·160	107·605 107·585	107·595	at div. 106 0 24 47 28 40,5 31 29	at div. 108 0 25 3 28 22 31 50	by div. 106 6 42,0 3 21,0	by div. 108 6 47,0 3 23,5	202,994
Continued.	1524	Neg.	113·20 96·80 111·10 98·26	105·000 103·950 104·680	104·475 104·315	104·395	at div. 104 0 35 11 38 21 41 44	at div. 106 0 34 55 38 38,5 41 24	by div. 104 6 33,0 3 16,5	by div. 106 6 29,0 3 14,5	196,105

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1525	Pos.	98·26 114·82 99·78 113·02	106·540 107·300 106·400	106·920 106·850	106·885	at div. 106 0 44 56 48 28 51 31,5	at div. 108 0 45 11,5 48 11 51 51	by div. 106 6 35,5 3 17,75	by div. 108 6 39,5 3 19,75	198,635
	1526	Neg.	113·02 96·20 111·00 97·98	104·610 103·600 104·490	104·105 104·045	104·075	at div. 104 0 55 4 58 21 1 1 39	at div. 106 0 54 49 58 38 1 1 20	by div. 104 6 35,0 3 17,5	by div. 106 6 31,0 3 15,5	197,425
	1527	Pos.	97·98 114·90 99·94 113·50	106·440 107·420 106·720	106·930 107·070	107·000	at div. 106 1 4 55 8 27 11 26	at div. 108 1 5 9,5 8 10 11 45	by div. 106 6 31,0 3 15.50	by div. 108 6 35,5 3 17,75	196,625
	1528	Neg.	113·50 96·00 111·50 97·60	104·750 103·750 104·550	104·250 104·150	104·200	at div. 104 1 15 0 18 14,5 21 35,5	at div. 106 1 14 45,5 18 31 21 17	by div. 104 6 35,5 3 17,75	by div. 106 6 31,5 3 15,75	197,550
	1529	Pos.	97·60 115·32 99·50 113·80	106·460 107·410 106·650	106·935 107·030	106·982	at div. 106 1 24 51,5 28 35 31 28	at div. 108 1 25 6 28 9 31 46	by div. 106 6 36,5 3 18,25	by div. 108 6 40,0 3 20,00	199, 109
T=38·67 B=30·392	1530	Neg.	113·80 95·44 111·54 96·76	104·620 103·490 104·150	104·055 103·820	103·937	at div. 102 1 35 16,5 38 7 41 57,5	at div. 104 1 35 2 38 23 41 40	by div. 102 6 41,0 3 20,5	by div. 104 6 38,0 3 19,0	199,047
Jan. 20 T=37·58 B=30·174	1531	Pos.	102·48 116·40 104·04 114·98	109·440 110·220 109·510	109·830 109·865	109·847	at div. 108 9 38 18,5 42 9 44 44	at div. 110 9 38 36,5 41 44,5 45 7	by div. 108 6 25,5 3 12,75	by div. 110 6 30,5 3 15,25	195,058
	1532	Neg.	114·98 99·84 113·26 101·10	107·410 106·550 107·180	106·980 106·865	106·922	at div. 106 9 48 35 missed. 55 6,5	at div. 108 9 48 18,5 missed. 54 46	by div. 106 6 31,5 3 15,75	by div. 108 6 27,5 3 13,75	194,828
	1533	Pos.	101·10 117·00 102·90 115·50	109·050 109·950 109·200	109·500 109·575	109·537	at div. 108 9 58 9 10 1 50 4 37	at div. 110 9 58 24,5 10 1 32,5 4 56,5	by div. 108 6 28,0 3 14,0	by div. 110 6 32,0 3 16,0	195,537
	1534	Neg.	115·50 98·82 113·62 100·40	107·160 106·220 107·010	106·690 106·615	106·652	at div. 106 10 8 17,5 11 22 14 49,5	at div. 108 10 8 2,5 11 39 14 30,5	by div. 106 6 32,0 3 16,0	by div. 108 6 28,0 3 14,0	195,348
	1535	Pos.	100·40 117·54 102·18 115·90	108·970 109·860 109·040	109·415 109·450	109·432	at div. 108 10 17 56 21 35 24 27	at div. 110 10 18 10,5 21 19 24 45,5	by div. 108 6 31,0 3 15,5	by div. 110 6 35,0 3 17,5	196,932
Continued.	1536	Neg.	115·90 98·28 114·22 99·68	107·090 106·250 106·950	106·670 106·600	106·635	at div. 106 10 28 5 31 13 34 40	at div. 108 10 27 50,5 31 29 34 22,5	by div. 106 6 35,0 3 17,5	by div. 108 6 32,0 3 16,0	197,024

33rd Series continued.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1537	Pos.	99·68 118·32 101·62 116·62	109·000 109·970 109·120	109·485 109·545	109·515	at div. 108 10 37 47,5 41 25,5 44 20	at div. 110 10 38 1 41 10 44 36,5	by div. 108 6 32,5 3 16,25	by div. 110 6 35,5 3 17,75	197,386
	1538	Neg.	116·62 97·72 114·92 99·94	107·170 106·320 107·430	106·745 106·875	106·810	at div. 106 10 47 58 51 7,5 54 42	at div. 108 10 47 44,5 51 22,5 54 24,5	by div. 106 6 44,0 3 22,0	by div. 108 6 40,0 3 20,0	201,190
	1539	Pos.	99·94 116·32 97·78 113·00	108·130 107·050 105·390	107·590 106·220	106·905	at div. 106 10 57 33 11 0 58 4 17	at div. 108 10 57 47 11 0 45 4 34	by div. 106 6 44,0 3 22,0	by div. 108 6 47,0 3 23,5	202,678
	1540	Neg.	113·00 94·86 111·30 97·20	103·930 103·080 104·250	103·505 103·665	103·585	at div. 102 11 7 52 10 55 14 39	at div. 104 11 7 38 11 11 14 21,5	by div. 102 6 47,0 3 23,50	by div. 104 6 43,5 3 21,75	202,113
	1541	Pos.	97·20 114·90 99·56 112·60	106·050 107·230 106·080	106·640 106·650	106·645	at div. 106 11 17 39 21 1,5 24 6	at div. 108 11 17 53 20 45,5 24 25	by div. 106 6 27,0 3 13,5	by div. 108 6 32,0 3 16,0	194,306
	1542	Neg.	112·60 93·28 109·18 94·00	102·940 101·230 101·590	102·085 101·410	101·747	at div. 100 11 27 48,5 30 40 34 30	at div. 102 11 27 35 30 57 34 12,5	by div. 100 6 41,5 3 20,75	by div. 102 6 37,5 3 18,75	199,003
	1543	Pos.	94·00 112·40 93·20 110·00	103·200 102·800 101·600	103·000 102·200	102·600	at div. 102 11 37 42,5 41 37 45 11	at div. 104 11 37 58 41 21 45 28	by div. 102 7 28,5 3 44,25	by div. 104 7 30,0 3 45,00	224,700
T=37·81 B=30·132	1544	Neg.	110·00 89·20 107·50 91·80	99·600 98·350 99·650	98·975 99·000	98·987	at div. 98 11 48 56 52 18 56 9	at div. 100 11 48 43 52 33 55 51,5	by div. 98 7 13,0 3 36,50	by div. 100 7 8,5 3 34,25	215,390

34th Series.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
Jan. 23 T=37·98 B=29·250	1545	Pos.	95·40 107·40 96·64 106·48	101·400 102·020 101·560	101·710 101·790	101·750	at div. 100 10 19 47 22 48,5 24 48	at div. 102 10 20 3 22 29,5 25 8	by div. 100 5 1,0 2 30,5	by div. 102 5 5,0 2 32,5	152,250
	1546	Neg.	106·48 93·98 105·30 94·90	100·230 99·640 100·100	99·935 99·870	99·902	at div. 98 10 27 56 29 57 33 4	at div. 100 10 27 41 30 15 32 45	by div. 98 5 8,0 2 34,0	by div. 100 5 4,0 2 32,0	152,098
Continued.	1547	Pos.	94·90 107·60 96·02 106·48	101·250 101·810 101·250	101·530 101·530	101·530	at div. 100 10 35 11,5 38 9,5 40 15	at div. 102 10 35 27,5 37 52 40 34	by div. 100 5 3,5 2 31,75	by div. 102 5 6,5 2 33,25	152,897

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1548	Neg.	106·48 93·60 105·26 94·44	100·040 99·430 99·850	99·735 99·640	99·687	at div. 98 10 43 17 45 25 48 24	at div. 100 10 43 2 45 41 48 6	by div. 98 5 7,0 2 33,5	by div. 100 5 4,0 2 32,0	s 152,235
	1549	Pos.	94·44 107·44 95·54 106·26	100·940 101·490 100·900	101·215 101·195	101·205	at div. 100 10 50 38,5 53 31 55 44	at div. 102 10 50 53,5 53 14 56 3	by div. 100 5 5,5 2 32,75	by div. 102 5 9,5 2 34,75	153,955
	1550	Neg.	106·26 92·90 104·84 93·74	99·580 98·870 99·290	99·225 99·080	99·152	at div. 98 10 58 39 11 0 55 3 46,5	at div. 100 10 58 24 11 1 10 3 28,5	by div. 98 5 7,5 2 33,75	by div. 100 5 4,5 2 32,25	152,886
	1551	Pos.	93·74 107·04 94·84 105·82	100·390 100·940 100·330	100·665 100·635	100·650	at div. 100 11 6 10 8 56 11 19	at div. 102 11 6 25 8 39,5 11 37	by div. 100 5 9,0 2 34,5	by div. 102 5 12,0 2 36,0	154,987
T = 38·10 B = 29·250	1552	Neg.	105·82 92·60 104·72 93·72	99·210 98·660 99·220	98·935 98·940	98·937	at div. 98 11 14 9 16 30 19 19	at div. 100 11 13 54,5 16 46 19 1	by div. 98 5 10,0 2 35,00	by div. 100 5 6,5 2 32,25	153,712
Jan. 24 T = 35·67 B = 29·856	1553	Pos.	101·12 110·00 102·02 109·36	105·560 106·010 105·690	105·785 105·850	105·817	at div. 104 9 44 30 47 49 49 31,5	at div. 106 9 44 55 47 23 49 59	by div. 104 5 1,5 2 30,75	by div. 106 5 4,0 2 32,00	151,885
	1554	Neg.	109·36 99·10 108·50 100·08	104·230 103·800 104·290	104·015 104·045	104·030	at div. 104 9 52 34 55 5 57 37	at div. 106 9 52 15 55 27 57 14	by div. 104 5 3,0 2 31,5	by div. 106 4 59,0 2 29,5	151,470
	1555	Pos.	100·08 110·80 101·00 109·80	105·440 105·900 105·400	105·670 105·650	105·660	at div. 104 9 59 59 10 3 3,5 5 2	at div. 106 10 0 18 2 43 5 24	by div. 104 5 3,0 2 31,5	by div. 106 5 6,0 2 33,0	152,745
	1556	Neg.	109·80 98·46 108·40 99·40	104·130 103·430 103·900	103·780 103·665	103·722	at div. 102 10 8 10,5 10 12 13 18	at div. 104 10 7 53 10 31,5 12 56	by div. 102 5 7,5 2 33,75	by div. 104 5 3,0 2 31,50	151,813
	1557	Pos.	99·40 110·74 100·50 109·60	105·070 105·620 105·050	105·345 105·335	105·340	at div. 104 10 15 25,5 18 21,5 20 29	at div. 106 10 15 43 18 2,5 20 50	by div. 104 5 3,5 2 31,75	by div. 106 5 7,0 2 33,50	152,922
	1558	Neg.	109·60 97·94 108·10 98·90	103·770 103·020 103·500	103·395 103·260	103·327	at div. 102 10 23 30 25 39 28 37	at div. 104 10 23 13 25 58 28 15,5	by div. 102 5 7,0 2 33,50	by div. 104 5 2,5 2 31,25	152,007
Continued.	1559	Pos.	98·90 110·30 99·88 109·14	104·600 105·090 104·510	104·845 104·800	104·822	at div. 104 10 30 55 33 42,5 35 59,5	at div. 106 10 31 12 33 24 36 20	by div. 104 5 4,5 2 32,25	by div. 106 5 8,0 2 34,00	152,969

34th Series continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1560	Neg.	109·14 97·34 107·86 98·20	103·240 102·600 103·030	102·920 102·815	102·867	at div. 102 10 38 51 41 8 43 54	at div. 104 10 38 34 41 27 43 34	by div. 102 5 3,0 2 31,5	by div. 104 5 0,0 2 30,0	• 150,850
	1561	Pos.	98·20 110·08 99·00 109·02	104·140 104·540 104·010	104·340 104·275	104·307	at div. 104 10 46 20 48 58,5 51 25	at div. 106 10 46 37,5 48 40 51 45,5	by div. 104 5 5,0 2 32,5	by div. 106 5 8,0 2 34,0	152,730
	1562	Neg.	109·02 96·28 107·74 97·26	102·650 102·010 102·500	102·330 102·255	102·292	at div. 102 10 54 4 56 30,5 59 5	at div. 104 10 53 48 56 48 58 46	by div. 102 5 1,0 2 30,5	by div. 104 4 58,0 2 29,0	150,281
	1563	Pos.	97·26 109·62 98·56 108·20	103·440 104·090 103·380	103·765 103·735	103·750	at div. 102 11 1 29 4 28 6 28	at div. 104 11 1 44,5 4 11 6 48	by div. 102 4 59,0 2 29,50	by div. 104 5 3,5 2 31,75	151,470
	1564	Neg.	108·20 96·10 106·88 97·00	102·150 101·490 101·940	101·820 101·715	101·767	at div. 100 11 9 32,5 11 30,5 14 33	at div. 102 11 9 16 11 49 14 13	by div. 100 5 0,5 2 30,25	by div. 102 4 57,0 2 28,50	148,704
	1565	Pos.	97·00 109·20 98·20 108·28	103·100 103·700 103·240	103·400 103·470	103·435	at div. 102 11 16 40,5 19 35 21 41	at div. 104 11 16 56,5 19 17,5 22 0	by div. 102 5 0,5 2 30,25	by div. 104 5 3,5 2 31,75	151,326
T = 35·58 B = 29·850	1566	Neg.	108·28 95·96 107·16 97·02	102·120 101·560 102·090	101·840 101·825	101·832	at div. 100 11 24 44 26 45 29 51	at div. 102 11 24 28 27 3 29 31,5	by div. 100 5 7,0 2 33,50	by div. 102 5 3,5 2 31,75	151,897
Jan. 25 T = 34·60 B = 29·372	1567	Pos.	94·38 107·30 95·74 106·28	100·840 101·520 101·010	101·180 101·265	101·222	at div. 100 9 55 58 58 55 10 1 10	at div. 102 9 56 14 58 36,5 10 1 29	by div. 100 5 12,0 2 36,0	by div. 102 5 15,0 2 37,5	156,916
	1568	Neg.	106·28 92·90 105·14 94·40	99·590 99·020 99·770	99·305 99·395	99·350	at div. 98 10 4 12,5 6 30 9 35	at div. 100 10 3 57 6 47 9 16	by div. 98 5 22,5 2 41,25	by div. 100 5 19,0 2 39,50	160,069
	1569	Pos.	94·40 107·70 96·30 106·80	101·050 102·000 101·550	101·525 101·775	101·650	at div. 100 10 11 55 14 57 17 3	at div. 102 10 12 10,5 14 38,5 17 23	by div. 100 5 8,0 2 34,00	by div. 102 5 12,5 2 36,25	155,855
	1570	Neg.	106·80 94·16 105·82 95·50	100·480 99·990 100·660	100·235 100·325	100·280	at div. 100 10 20 3,5 22 38 25 21	at div. 102 10 19 47,5 22 56 25 1	by div. 100 5 17,5 2 38,75	by div. 102 5 13,5 2 36,75	158,470
Continued.	1571	Pos.	95·50 108·48 96·90 107·60	101·990 102·690 102·250	102·340 102·470	102·405	at div. 102 10 27 58,5 30 42 33 12	at div. 104 10 28 14 30 24 33 31	by div. 102 5 13,5 2 36,75	by div. 104 5 17,0 2 38,50	157,104

34^{th} SERIES continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1572	Neg.	107·60 94·74 106·62 96·00	101·170 100·680 101·310	100·925 100·995	100·960	at div. 100 10 36 4,5 38 28 41 23	at div. 102 10 35 47,5 38 45 41 4	by div. 100 5 18,5 2 39,25	by div. 102 5 16,5 2 38,25	158,770
	1573	Pos.	96·00 109·30 97·78 108·60	102·650 103·540 103·190	103·095 103·365	103·230	at div. 102 10 43 48 46 43 48 57	at div. 104 10 44 3 46 26 49 16	by div. 102 5 9,0 2 34,5	by div. 104 5 13,0 2 36,5	155,730
	1574	Neg.	108·60 95·84 107·90 97·72	102·220 101·870 102·810	102·045 102·340	102·192	at div. 102 10 51 49 54 27 57 10,5	at div. 104 10 51 33,5 54 44 56 51	by div. 102 5 21,5 2 40,75	by div. 104 5 17,5 2 38,75	160,558
	1575	Pos.	97·72 111·00 99·32 110·00	104·360 105·160 104·660	104·760 104·910	104·835	at div. 104 10 59 43 11 2 33 4 55	at div. 106 10 59 58,5 11 2 16 5 14	by div. 104 5 12,0 2 36,00	by div. 106 5 15,5 2 37,75	156,730
	1576	Neg.	110·00 96·80 108·80 97·82	103·400 102·800 103·310	103·100 103·055	103·077	at div. 102 11 7 52 10 11 13 8	at div. 104 11 7 37 10 29 12 49,5	by div. 102 5 16,0 2 38,00	by div. 104 5 12,5 2 36,25	157,058
	1577	Pos.	97·82 111·40 99·16 110·46	104·610 105·280 104·810	104·945 105·045	104·995	at div. 104 11 15 33,5 18 25,5 20 46	at div. 106 11 15 48,5 18 9 21 4	by div. 104 5 12,5 2 36,25	by div. 106 5 15,5 2 37,75	156,996
T = 35·07 B = 29·440	1578	Neg.	110·46 96·80 109·50 98·24	103·630 103·150 103·870	103·390 103·510	103·450	at div. 102 11 23 43 26 0 29 2,5	at div. 104 11 23 28,5 26 16,5 28 44	by div. 102 5 19,5 2 39,75	by div. 104 5 15,5 2 37,75	158,300

35^{th} SERIES.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

Jan. 26 T = 37·75 B = 29·300	1579	Pos.	82·70 102·36 85·00 100·22	92·530 93·680 92·610	93·105 93·145	93·125	at div. 92 11 10 59 14 24,5 17 18	at div. 94 11 11 11,5 14 10 17 34	by div. 92 6 19,0 3 9,50	by div. 94 6 22,5 3 11,25	190,484
	1580	Neg.	100·22 81·80 97·90 83·70	91·010 89·850 90·800	90·430 90·325	90·377	at div. 90 11 20 43,5 23 49 27 4,5	at div. 92 11 20 30,5 24 4,5 26 48	by div. 90 6 21,0 3 10,50	by div. 92 6 17,5 3 8,75	190,171
	1581	Pos.	83·70 101·34 85·80 99·70	92·520 93·570 92·750	93·045 93·160	93·102	at div. 92 11 30 12,5 33 39 36 32	at div. 94 11 30 26,5 33 23 36 50	by div. 92 6 19,5 3 9,75	by div. 94 6 23,5 3 11,75	190,852
Continued.	1582	Neg.	99·70 82·00 97·72 83·82	90·850 89·860 90·770	90·355 90·315	90·335	at div. 90 11 39 59,5 43 8,5 46 26	at div. 92 11 39 45,5 43 24 46 8	by div. 90 6 26,5 3 13,25	by div. 92 6 22,5 3 11,25	192,915

35th SERIES continued.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1583	Pos.	83·82 101·48 85·92 99·80	92·650 93·700 92·860	93·175 93·280	93·227	at div. 92 11 49 34 53 7 56 1	at div. 94 11 49 48,5 52 51,5 56 19,5	by div. 92 6 27,0 3 13,5	by div. 94 6 31,0 3 15,5	• 194,727
	1584	Neg.	99·80 82·12 97·78 84·12	90·960 89·950 90·950	90·455 90·450	90·452	at div. 90 11 59 35,5 0 2 46 6 11	at div. 92 11 59 21 0 3 2 5 52	by div. 90 6 35,5 3 17,75	by div. 92 6 31,0 3 15,50	197,242
	1585	Pos.	84·12 101·62 86·54 99·80	92·870 94·080 93·170	93·475 93·625	93·550	at div. 92 0 9 19,5 13 1 15 51,5	at div. 94 0 9 34 12 44,5 16 11	by div. 92 6 32,0 3 16,0	by div. 94 6 37,0 3 18,5	197,937
T=37·95 B=29·216	1586	Neg.	99·80 82·64 97·64 84·56	91·220 90·140 91·100	90·680 90·620	90·650	at div. 90 0 19 33 22 41 26 11	at div. 92 0 19 18 23 0 25 51	by div. 90 6 38,0 3 19,0	by div. 92 6 33,0 3 16,5	198,188
Jan. 27 T=39·61 B=29·700	1587	Pos.	98·70 116·70 101·30 115·00	107·700 109·000 108·150	108·350 108·575	108·462	at div. 108 9 43 50 47 8 50 13	at div. 110 9 44 4 46 51,5 50 32	by div. 108 6 23,0 3 11,5	by div. 110 6 28,0 3 14,0	192,077
	1588	Neg.	115·00 98·00 113·02 100·00	106·500 105·510 106·510	106·005 106·010	106·007	at div. 106 9 53 36 56 50 10 0 5	at div. 108 9 53 21 57 7,5 59 46	by div. 106 6 29,0 3 14,5	by div. 108 6 25,0 3 12,5	194,493
T= B=	1589	Pos.	100·00 116·80 102·08 114·90	108·400 109·440 108·490	108·920 108·965	108·942	at div. 108 10 3 18 6 47 9 44	at div. 110 10 3 33 6 29 10 3	by div. 108 6 26,0 3 13,0	by div. 110 6 30,0 3 15,0	193,942
Jan. 28 T=40·50 B=29·850	1590	Pos.	101·94 113·30 103·40 112·00	107·620 108·350 107·700	107·985 108·025	108·005	at div. 108 9 47 9 50 23 53 36	at div. 110 9 47 32 49 57 54 5	by div. 108 6 27,0 3 13,5	by div. 110 6 33,0 3 16,5	193,507
	1591	Neg.	112·00 99·10 110·10 100·00	105·550 104·600 105·050	105·075 104·825	104·950	at div. 104 9 57 10 59 56 10 3 33	at div. 106 9 56 51 10 0 24 3 8	by div. 104 6 23,0 3 11,5	by div. 106 6 17,0 3 8,5	190,075
	1592	Pos.	100·00 114·00 101·52 112·30	107·000 107·760 106·910	107·380 107·335	107·357	at div. 106 10 6 28,5 10 6,5 12 51,5	at div. 108 10 6 46 9 46,5 13 14,5	by div. 106 6 23,0 3 11,50	by div. 108 6 28,5 3 14,25	193,366
	1593	Neg.	112·30 97·60 110·30 98·84	104·950 103·950 104·570	104·450 104·260	104·355	at div. 104 10 16 31,5 19 38 22 55	at div. 106 10 16 15 19 58 22 33,5	by div. 104 6 23,5 3 11,75	by div. 106 6 18,5 3 9,25	191,307
Continued.	1594	Pos.	98·84 114·10 100·60 112·60	106·470 107·350 106·600	106·910 106·975	106·942	at div. 106 10 26 5,5 29 35 32 32	at div. 108 10 26 22 29 16,5 32 52,5	by div. 106 6 26,5 3 13,25	by div. 108 6 30,5 3 15,25	194,192

35th SERIES continued.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1595	Neg.	112·60 96·50 110·76 98·00	104·550 103·630 104·380	104·090 104·005	104·047	at div. 104 10 35 58,5 39 13 42 27	at div. 106 10 35 43 39 31 42 7	by div. 104 6 28,5 3 14,25	by div. 106 6 24,0 3 12,00	* 194,197
	1596	Pos.	98·00 114·62 100·30 113·12	106·310 107·460 106·710	106·885 107·085	106·985	at div. 106 10 45 41 49 9 52 5	at div. 108 10 45 56 48 51,5 52 24,5	by div. 106 6 24,0 3 12,00	by div. 108 6 28,5 3 14,25	193,108
	1597	Neg.	113·12 96·88 111·60 98·80	105·000 104·240 105·200	104·620 104·720	104·670	at div. 104 10 55 37,5 58 41,5 11 2 9	at div. 106 10 55 22,5 58 59 11 1 50	by div. 104 6 31,5 3 15,75	by div. 106 6 27,5 3 13,75	195,080
	1598	Pos.	98·80 115·80 101·92 116·00	107·300 108·860 108·960	108·080 108·910	108·495	at div. 108 11 5 25 8 43 11 42	at div. 110 11 5 40 8 25 12 0	by div. 108 6 17,0 3 8,5	by div. 110 6 20,0 3 10,0	188,871
	1599	Neg.	116·00 95·30 112·32 96·70	105·650 103·810 104·510	104·730 104·160	104·445	at div. 104 11 15 22 18 34 21 55	at div. 106 11 15 9,5 18 49 21 39,5	by div. 104 6 33,0 3 16,5	by div. 106 6 30,0 3 15,0	196,167
	1600	Pos.	96·70 116·58 99·32 115·06	106·640 107·950 107·190	107·295 107·570	107·432	at div. 106 11 25 14 28 55 31 54	at div. 108 11 25 27 28 39,5 31 10,5	by div. 106 6 40,0 3 20,00	by div. 108 6 43,5 3 21,75	201,253
T=40·77 B=29·868	1601	Neg.	115·06 96·40 113·70 99·60	105·730 105·050 106·650	105·390 105·850	105·620	at div. 104 11 35 43 38 47 42 43	at div. 106 11 35 29 39 2 42 24	by div. 104 7 0,0 3 30,0	by div. 106 6 55,0 3 27,5	207,975

36th SERIES.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

Jan. 30 T=39·77 B=30·250	1602	Pos.	96·50 112·00 98·48 111·08	104·250 105·240 104·780	104·745 105·010	104·877	at div. 104 9 43 0,5 46 47 50 1,5	at div. 106 9 43 18 46 28 50 23	by div. 104 7 1,0 3 30,5	by div. 106 7 5,0 3 32,5	211,375
	1603	Neg.	111·08 93·00 109·40 94·10	102·040 101·200 101·750	101·620 101·475	101·547	at div. 100 9 54 3 57 11,5 10 1 11	at div. 102 9 53 48 57 28 10 0 53	by div. 100 7 8,0 3 34,0	by div. 102 7 5,0 3 32,5	212,840
	1604	Pos.	94·10 114·60 95·98 112·90	104·350 105·290 104·440	104·820 104·865	104·842	at div. 104 10 4 33,5 8 18 11 39,5	at div. 106 10 4 47 8 4 11 56	by div. 104 7 6,0 3 33,0	by div. 106 7 9,0 3 34,5	213,631
Continued.	1605	Neg.	112·90 90·74 111·26 92·54	101·820 101·000 101·900	101·410 101·450	101·430	at div. 100 10 15 31 18 48 22 41	at div. 102 10 15 18 19 1,5 22 26	by div. 100 7 10,0 3 35,0	by div. 102 7 8,0 3 34,0	214,285

36th SERIES continued.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1606	Pos.	92·54 116·54 94·50 114·78	104·540 105·520 104·640	105·030 105·080	105·055	at div. 104 10 26 2 29 47 33 8,5	at div. 106 10 26 13,5 29 35 33 22	by div. 104 7 6,5 3 33,25	by div. 106 7 8,5 3 34,25	213,777
	1607	Neg.	114·78 89·10 112·74 90·60	101·940 100·920 101·670	101·430 101·295	101·362	at div. 100 10 36 59,5 40 18 44 7	at div. 102 10 36 49 40 30 43 54,5	by div. 100 7 7,5 3 33,75	by div. 102 7 5,5 3 32,75	213,069
	1608	Pos.	90·60 117·80 92·70 116·02	104·200 105·250 104·360	104·725 104·805	104·765	at div. 104 10 47 35 51 17 54 45	at div. 106 10 47 45 51 6,5 54 57	by div. 104 7 10,0 3 35,0	by div. 106 7 12,0 3 36,0	215,382
T = 40·00 B = 30·268	1609	Neg.	116·02 87·80 114·42 90·50	101·910 101·110 102·460	101·520 101·785	101·647	at div. 100 10 58 36,5 11 1 58 5 55,5	at div. 102 10 58 26,5 11 2 8 5 43,5	by div. 100 7 19,0 3 39,5	by div. 102 7 17,0 3 38,5	218,677
Jan. 31 T = 40·81 B = 30·124	1610	Pos.	95·02 115·98 96·40 114·04	105·500 106·190 105·220	105·845 105·705	105·775	at div. 104 9 48 0 52 54 55 2	at div. 106 9 48 13,5 52 40,5 55 17,5	by div. 104 7 2,0 3 31,0	by div. 106 7 4,0 3 32,0	211,887
	1611	Neg.	114·04 90·70 112·26 91·80	102·370 101·480 102·030	101·925 101·755	101·840	at div. 100 9 59 0 10 2 9 6 4	at div. 102 9 58 48 10 2 22 5 50	by div. 100 7 4,0 3 32,0	by div. 102 7 2,0 3 31,0	211,080
	1612	Pos.	91·80 117·70 93·60 116·00	104·750 105·650 104·800	105·200 105·225	105·212	at div. 104 10 9 23,5 13 8,5 16 27	at div. 106 10 9 34 12 57 16 39	by div. 104 7 3,5 3 31,75	by div. 106 7 5,0 3 32,50	212,204
			Here I	was in	terrupted	for a wards	short time: continued as	but the series follows.	was after-		
	1613	Pos.	89·54 119·30 91·50 117·52	104·420 105·400 104·510	104·910 104·955	104·932	at div. 104 10 30 48 34 31 37 56	at div. 106 10 30 57,5 34 21 38 6,5	by div. 104 7 8,0 3 34,0	by div. 106 7 9,0 3 34,5	214,233
	1614	Neg.	117·52 86·32 115·80 88·72	101·920 101·060 102·260	101·490 101·660	101·575	at div. 100 10 41 44 missed. 48 59	at div. 102 10 41 35,5 missed. 48 49	by div. 100 7 15,0 3 37,50	by div. 102 7 13,5 3 36,75	216,910
	1615	Pos.	88·72 121·90 91·86 120·70	105·310 106·880 106·280	106·095 106·580	106·337	at div. 106 10 52 31 56 9,5 59 42,5	at div. 108 10 52 39,5 56 0 59 52	by div. 106 7 11,5 3 35,75	by div. 108 7 12,5 3 36,25	215,834
Continued.	1616	Neg.	120·70 87·60 119·12 90·80	104·150 103·360 104·960	103·755 104·160	103·957	at div. 102 11 3 32,5 6 56 10 55	at div. 104 11 3 24,5 7 5,5 10 45,5	by div. 102 7 22,5 3 41,25	by div. 104 7 21,0 3 40,50	220,517

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1617	Pos.	90·80 125·00 94·20 123·30	107·900 109·600 108·750	108·750 109·175	108·962	at div. 108 11 14 23 18 9 21 38	at div. 110 11 14 31 18 0 21 47,5	by div. 108 7 15,0 3 37,50	by div. 110 7 16,5 3 38,25	s 217,860
	1618	Neg.	123·30 89·92 121·00 93·02	106·610 105·460 107·010	106·035 106·235	106·135	at div. 106 11 25 26,5 29 7 32 50	at div. 108 11 25 18 29 16 32 40	by div. 106 7 23,5 3 41,75	by div. 108 7 22,0 3 41,00	221,698
	1619	Pos.	93·02 126·26 96·10 123·80	109·640 111·180 109·950	110·410 110·565	110·487	at div. 110 11 36 30,5 40 14,5 43 49	at div. 112 11 36 39,5 40 5 43 59	by div. 110 7 18,5 3 39,25	by div. 112 7 19,5 3 39,75	219,371
T=41·40 B=30·100	1620	Neg.	123·80 91·34 121·90 94·60	107·570 106·620 108·250	107·095 107·435	107·265	at div. 106 11 47 39,5 51 9,5 55 3,5	at div. 108 11 47 31 51 19 54 53	by div. 106 7 24,0 3 42,0	by div. 108 7 22,0 3 41,0	221,368

37th Series.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·367 inch.

Feb. 5 T=43·53 B=30·290	1621	Pos.	93·50 115·88 96·50 113·00	104·690 106·190 104·750	105·440 105·470	105·455	at div. 104 9 59 44 10 4 29 8 24	at div. 106 9 59 59 10 4 12 8 45	by div. 104 8 40,0 4 20,0	by div. 106 8 46,0 4 23,0	262,182
	1622	Neg.	113·00 89·20 109·36 92·00	101·100 99·280 100·680	100·190 99·980	100·085	at div. 100 10 13 8 17 27 21 50	at div. 102 10 12 53,5 17 44 21 31	by div. 100 8 42,0 4 21,00	by div. 102 8 37,5 4 18,75	260,905
	1623	Pos.	92·00 115·80 94·40 112·02	103·900 105·100 103·210	104·500 104·155	104·327	at div. 104 10 26 13 30 42 35 0	at div. 106 10 26 27 30 26,5 35 18,5	by div. 104 8 47,0 4 23,50	by div. 106 8 51,5 4 25,75	263,868
	1624	Neg.	112·02 87·50 107·90 90·32	99·760 97·700 99·110	98·730 98·405	98·567	at div. 98 10 39 26 43 35 48 0	at div. 100 10 39 13,5 43 52 47 41	by div. 98 8 34,0 4 17,00	by div. 100 8 27,5 4 13,75	256,079
	1625	Pos.	90·32 114·88 94·90 112·20	102·600 104·890 103·550	103·745 104·220	103·982	at div. 102 10 52 10 56 52 11 0 31	at div. 104 10 52 23,5 56 36 11 0 50	by div. 102 8 21,0 4 10,50	by div. 104 8 26,5 4 13,25	253,225
	1626	Neg.	112·20 88·80 109·06 92·40	100·500 98·930 100·730	99·715 99·830	99·772	at div. 98 10 5 28 9 17,5 14 10	at div. 100 11 5 13 9 34,5 13 49,5	by div. 98 8 42,0 4 21,00	by div. 100 8 36,5 4 18,25	258,564
Continued.	1627	Pos.	92·40 116·50 97·30 114·70	104·450 106·900 106·000	105·675 106·450	106·062	at div. 106 11 18 23 22 38 26 52	at div. 108 11 18 37 22 20 27 11	by div. 106 8 29,0 4 14,5	by div. 108 8 34,0 4 17,0	254,577

37th Series continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance =·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times. h m s	Observed Times. h m s	2 N m s	2 N m s	N for Mean Resting Point.
Continued. T=43·55 B=30·196	1628	Neg.	114·70 90·72 111·70 94·40	102·710 101·210 103·050	101·960 102·130	102·045	at div. 102 11 32 21 35 46 40 11	at div. 104 11 31 7 missed. 39 52	by div. 102 8 50,0 4 25,0	by div. 104 8 45,0 4 22,5	⁎ 264,944

38th Series.—2-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times. h m s	Observed Times. h m s	2 N m s	2 N m s	N for Mean Resting Point.
Feb. 7 T=38·95 B=29·736	1629	Pos.	98·20 116·92 98·88 116·72	107·560 107·900 107·800	107·730 107·850	107·790	at div. 106 9 48 32 52 34,5 55 43	at div. 108 9 48 47 53 19 55 59	by div. 106 7 11,0 3 35,5	by div. 108 7 12,0 3 36,0	215,947
	1630	Neg.	116·72 91·64 116·20 92·28	104·180 103·920 204·240	104·050 104·080	104·065	at div. 104 9 59 39 10 3 16 6 53	at div. 106 9 59 28 10 3 27 6 41,5	by div. 104 7 14,0 3 37,00	by div. 106 7 13,5 3 36,75	216,992
	1631	Pos.	92·28 123·20 93·14 122·60	107·740 108·170 107·870	107·955 108·020	107·987	at div. 106 10 10 26 14 21 17 39,5	at div. 108 10 10 35 14 21 17 49	by div. 106 7 13,5 3 36,75	by div. 108 7 14,0 3 37,00	216,998
	1632	Neg.	122·60 86·18 121·70 87·00	104·390 103·940 104·350	104·165 104·145	104·155	at div. 104 10 21 29,5 25 6,5 28 45	at div. 106 10 21 22 25 14 28 37	by div. 104 7 15,5 3 37,75	by div. 106 7 15,0 3 37,50	217,731
	1633	Pos.	87·00 128·60 88·00 127·88	107·800 108·300 107·940	108·050 108·120	108·085	at div. 108 10 32 25 36 3 39 39	at div. 110 10 32 32 35 56 39 46	by div. 108 7 14,0 3 37,0	by div. 110 7 14,0 3 37,0	217,000
	1634	Neg.	127·88 80·60 126·30 81·90	104·240 103·450 104·100	103·845 103·775	103·810	at div. 102 10 43 26,5 46 53 50 42	at div. 104 10 43 20,5 46 59 50 35,5	by div. 102 7 15,5 3 37,75	by div. 104 7 15,0 3 37,50	217,525
	1635	Pos.	81·90 132·88 83·30 131·94	107·390 108·090 107·620	107·740 107·855	107·797	at div. 106 10 54 12,5 58 0 11 1 28	at div. 108 10 54 18 57 54 12 1 33,5	by div. 106 7 15,5 3 37,75	by div. 208 7 15,5 3 37,75	217,750
T=39·15 B=29·720	1636	Neg.	131·94 76·80 130·80 77·90	104·370 103·800 204·350	104·085 104·075	104·080	at div. 104 11 5 13 8 51 12 29	at div. 106 11 5 8 8 56 12 24	by div. 104 7 16,0 3 38,0	by div. 206 7 16,0 3 38,0	218,000

39th Series.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times. h m s	Observed Times. h m s	2 N m s	2 N m s	N for Mean Resting Point.
Feb. 8 T=39·75 B=29·840 Continued.	1637	Pos.	83·80 105·80 86·60 103·20	94·800 96·200 94·900	95·500 95·550	95·525	at div. 94 9 59 13 10 3 18 6 35	at div. 96 9 59 27 10 3 3 6 52	by div. 94 7 22,0 3 41,0	by div. 96 7 25,0 3 42,5	222,143

39th SERIES continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1638	Neg.	103·20 81·60 100·40 83·70	92·400 91·000 92·050	91·700 91·525	91·612	at div. 90 10 10 45,5 14 3 18 10	at div. 92 10 10 32,5 14 18 17 52,5	by div. 90 7 24,5 3 42,25	by div. 92 7 20,0 3 40,00	* 220,437
	1639	Pos.	83·70 105·20 86·54 102·60	94·450 95·870 94·570	95·160 95·220	95·190	at div. 94 10 21 37,5 25 37 28 58	at div. 96 10 21 51 25 21,5 29 15,5	by div. 94 7 20,5 3 40,25	by div. 96 7 24,5 3 42,25	221,440
	1640	Neg.	102·60 81·50 100·02 83·70	92·050 90·760 91·860	91·405 91·310	91·357	at div. 90 10 33 3 36 25,5 40 26	at div. 92 10 32 50 36 41 40 9	by div. 90 7 23,0 3 41,5	by div. 92 7 19,0 3 39,5	220,143
	1641	Pos.	83·70 104·92 86·14 102·44	94·310 95·530 94·290	94·920 94·910	94·915	at div. 94 10 43 55 47 49 51 14	at div. 96 10 44 8 47 34 51 31	by div. 94 7 19,0 3 39,5	by div. 96 7 23,0 3 41,5	220,415
	1642	Neg.	102·44 80·82 99·70 83·12	91·630 90·260 91·410	90·945 90·835	90·890	at div. 90 10 55 13 58 40,5 11 2 36	at div. 92 10 55 0 58 55,5 11 2 19	by div. 90 7 23,0 3 41,5	by div. 92 7 19,0 3 39,5	220,610
	1643	Pos.	83·12 104·80 86·20 102·80	93·960 95·500 94·500	94·730 95·000	94·865	at div. 94 11 6 13,5 10 7 13 35,5	at div. 96 11 6 27 9 52 13 53,5	by div. 94 7 22,0 3 41,00	by div. 96 7 26,5 3 43,25	221,973
T = 39·85 B = 29·840	1644	Neg.	102·80 81·08 100·84 83·52	91·940 90·960 92·180	91·450 91·570	91·510	at div. 90 11 17 45 21 15,5 25 38	at div. 92 11 17 31,5 21 31 25 20	by div. 90 7 53,0 3 56,50	by div. 92 7 48,5 3 54,25	234,800

40th SERIES.—2-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

Feb. 9 T = 41·58 B = 29·814	1645	Pos.	45·50 162·40 50·50 157·70	103·950 106·450 104·100	105·200 105·275	105·237	at div. 105 10 0 53,5 10 8,5 19 26	at div. 110 10 1 9 9 53 19 43	by div. 105 18 32,5 9 16,25	by div. 110 18 34,0 9 17,00	556,286
	1646	Neg.	157·70 8·60 151·70 18·00	83·150 80·150 84·850	81·650 82·500	82·075	at div. 80 10 28 50 37 50 47 18	at div. 85 10 28 38 38 2,5 47 5	by div. 80 18 28,0 9 14,0	by div. 85 18 27,0 9 13,5	553,793
T = 41·87 B = 29·800	1647	Pos.	18·00 196·00 30·00 191·00	107·000 113·000 110·500	110·000 111·750	110·875	at div. 110 10 56 21 11 5 28 14 36,5	at div. 115 10 56 31 11 5 17,5 14 48	by div. 110 18 15,5 9 7,75	by div. 115 18 17,0 9 8,50	547,881

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41st Series.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Feb. 10 T = 44·88 B = 29·950	1648	Pos.	103·60 112·10 104·54 111·32	107·850 108·320 107·930	108·085 108·125	108·105	at div. 108 9 43 21 46 7 48 45,5	at div. 109 9 43 34 45 54 49 1	by div. 108 5 24,5 2 42,25	by div. 109 5 27,0 2 43,50	• 162,381
	1649	Neg.	111·32 101·40 110·40 102·32	106·360 105·900 106·360	106·130 106·130	106·130	at div. 106 9 51 38 54 17 57 3	at div. 107 9 51 28 54 29 56 51	by div. 106 5 25,0 2 42,5	by div. 107 5 23,0 2 41,5	162,370
	1650	Pos.	102·32 113·50 103·60 112·80	107·910 108·550 108·200	108·230 108·375	108·302	at div. 108 9 59 49 10 2 37 5 11	at div. 109 9 59 58,5 10 2 26,5 5 23	by div. 108 5 22,0 2 41,00	by div. 109 5 24,5 2 42,25	161,377
	1651	Neg.	112·80 100·82 111·80 101·94	106·810 106·310 106·870	106·560 106·590	106·575	at div. 106 10 8 7,5 10 42 13 35	at div. 107 10 7 59 10 51,5 13 24,5	by div. 106 5 27,5 2 43,75	by div. 107 5 25,5 2 42,75	163,175
	1652	Pos.	101·94 114·72 103·40 113·80	108·330 109·060 108·600	108·695 108·830	108·762	at div. 108 10 16 12 19 7 21 34	at div. 109 10 16 20 18 57,5 21 43	by div. 108 5 22,0 2 41,0	by div. 109 5 23,0 2 41,5	161,381
	1653	Neg.	113·80 100·68 112·70 101·92	107·240 106·690 107·310	106·965 107·000	106·982	at div. 106 10 24 34,5 27 1,5 30 2	at div. 107 10 24 26,5 27 10 29 52	by div. 106 5 27,5 2 43,75	by div. 107 5 25,5 2 42,75	162,768
	1654	Pos.	101·92 115·60 103·40 114·60	108·760 109·500 109·000	109·130 109·250	109·190	at div. 109 10 32 39 35 25 38 2	at div. 110 10 32 46,5 35 16 38 11,5	by div. 109 5 23,0 2 41,5	by div. 110 5 25,0 2 42,5	161,690
	1655	Neg.	114·60 100·88 113·36 102·20	107·740 107·120 107·780	107·430 107·450	107·440	at div. 107 10 40 54 43 31,5 46 22	at div. 108 10 40 46,5 43 40 46 13	by div. 107 5 28,0 2 44,00	by div. 108 5 26,5 2 43,25	163,670
	1656	Pos.	102·20 116·20 103·84 114·94	109·200 110·020 109·390	109·610 109·705	109·657	at div. 109 10 49 1,5 51 55 54 26	at div. 110 10 49 9 51 46,5 54 35,5	by div. 109 5 24,5 2 42,25	by div. 110 5 26,5 2 43,25	162,907
	1657	Neg.	114·94 101·20 113·50 102·52	108·070 107·350 108·010	107·710 107·680	107·695	at div. 107 10 57 26 59 59 11 2 54,5	at div. 108 10 57 18 11 0 7,5 2 45	by div. 107 5 28,5 2 44,25	by div. 108 5 27,0 2 43,50	163,730
	1658	Pos.	102·52 116·10 104·06 114·80	109·310 110·080 109·430	109·695 109·755	109·725	at div. 109 11 5 31 8 26,5 10 56,5	at div. 110 11 5 38,5 8 18 11 6	by div. 109 5 25,5 2 42,75	by div. 110 5 27,5 2 43,75	163,475
T = 45·31 B = 29·980	1659	Neg.	114·80 101·32 113·40 102·56	108·060 107·360 107·980	107·710 107·670	107·690	at div. 107 11 13 56,5 16 29 19 24	at div. 108 11 13 48,5 16 37 19 14	by div. 107 5 27,5 2 43,75	by div. 108 5 25.5 2 42,75	163,060

41st Series continued.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. Feb. 11 T=47·68 B=30·260	1660	Pos.	105·28 113·80 106·20 113·18	109·540 110·000 109·690	109·770 109·845	109·807	at div. 109 9 53 27 56 31 58 49	at div. 110 9 53 39 56 18 59 4	by div. 109 5 22,0 2 41,0	by div. 110 5 25,0 2 42,5	162,210
	1661	Neg.	113·18 103·00 112·34 103·90	108·090 107·670 108·120	107·880 107·895	107·887	at div. 107 10 1 58 4 20 7 23	at div. 108 10 1 47 4 31 7 10	by div. 107 5 25,0 2 42,5	by div. 108 5 23,0 2 41,5	161,613
	1662	Pos.	103·90 115·50 105·08 114·70	109·700 110·290 109·890	109·995 110·090	110·042	at div. 110 10 10 0 12 42 15 22,5	at div. 111 10 10 9 12 32 15 33	by div. 110 5 22,5 2 41,25	by div. 111 5 24,0 2 42,00	161,281
	1663	Neg.	114·70 102·18 113·60 103·20	108·440 107·890 108·400	108·165 108·145	108·155	at div. 108 10 18 10 20 50 23 35	at div. 109 10 18 2 20 59 23 25	by div. 108 5 25,0 2 42,5	by div. 109 5 23,0 2 41,5	162,345
	1664	Pos.	103·20 116·60 104·52 115·60	109·900 110·560 110·060	110·230 110·310	110·270	at div. 110 10 26 17,5 29 4 31 40	at div. 111 10 26 25,5 28 55 31 49,5	by div. 110 5 22,5 2 41,25	by div. 111 5 24,0 2 42,00	161,452
	1665	Neg.	115·60 101·86 114·48 103·00	108·730 108·170 108·740	108·450 108·455	108·452	at div. 108 10 34 32 37 7 39 57	at div. 109 10 34 24,5 37 16,5 39 48	by div. 108 5 25,0 2 42,50	by div. 109 5 23,5 2 41,75	162,161
	1666	Pos.	103·00 117·40 104·54 116·28	110·200 110·970 110·410	110·585 101·690	110·637	at div. 110 10 42 33,5 45 26 47 56	at div. 111 10 42 41 45 18 48 5	by div. 110 5 22,5 2 41,25	by div. 111 5 24,0 2 42,00	161,727
T=47·88 B=30·320	1667	Neg.	116·28 102·02 114·90 103·38	109·150 108·460 109·140	108·805 108·800	108·802	at div. 108 10 50 55 53 26 55 22	at div. 109 10 50 48 53 34 55 13	by div. 108 5 27,0 2 43,5	by div. 109 5 25,0 2 42,5	162,698

42nd Series.—2-inch *Zinc* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
Feb. 12 T=50·03 B=30·072	1668	Pos.	100·44 115·30 101·08 114·86	107·870 108·190 107·970	108·030 108·080	108·055	at div. 108 10 5 16 8 33,5 11 49	at div. 110 10 5 33 8 16 12 7,5	by div. 108 6 33,0 3 16,50	by div. 110 6 34,5 3 17,25	196,520
	1669	Neg.	114·86 95·50 114·30 96·20	105·180 104·900 105·250	105·040 105·075	105·057	at div. 104 10 15 15,5 18 19 21 50	at div. 106 10 15 2,5 18 32,5 21 36	by div. 104 6 34,5 3 17,25	by div. 106 6 33,5 3 16,75	196,986
Continued.	1670	Pos.	96·20 119·98 97·10 119·30	108·090 108·540 108·200	108·315 108·370	108·342	at div. 108 10 25 2,5 28 22 31 35	at div. 110 10 25 13 28 11 31 46,5	by div. 108 6 32,5 3 16,25	by div. 110 6 33,5 3 16,75	196,335

42nd Series continued.—2-inch *Zinc* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1671	Neg.	119·50 91·82 118·46 92·76	105·560 105·140 105·610	105·350 105·375	105·562	at div. 104 10 55 2,5 58 8 41 56,5	at div. 106 10 54 55,5 58 17 41 27	by div. 104 6 34,0 3 17,00	by div. 106 6 33,5 5 16,75	s 196,830
	1672	Pos.	92·76 125·80 95·98 122·90	108·280 108·890 108·440	108·585 108·665	108·625	at div. 108 10 44 48 48 9 51 20,5	at div. 110 10 44 56 48 1 51 29	by div. 108 6 32,5 3 16,25	by div. 110 6 55,0 5 16,50	196,328
	1673	Neg.	122·90 88·90 121·86 90·18	105·900 105·580 106·020	105·640 105·700	105·670	at div. 104 10 54 57 57 55 11 1 21	at div. 106 10 54 40 58 0,5 11 1 15,5	by div. 104 6 34.0 3 17,00	by div. 106 6 33,5 5 16,75	196,791
	1674	Pos.	90·18 126·80 91·72 125·72	108·490 109·260 108·720	108·875 108·990	108·952	at div. 108 11 4 52 7 55 11 5	at div. 110 11 4 59 7 48 11 12,5	by div. 108 6 33,0 3 16,50	by div. 110 6 33,5 3 16,75	196,616
	1675	Neg.	125·72 86·90 124·32 88·50	106·310 105·610 106·310	105·960 105·960	105·960	at div. 104 11 14 33,5 17 58 21 8	at div. 106 11 14 27 17 44,5 21 1	by div. 104 6 34,5 3 17,25	by div. 106 6 34,0 5 17,00	197,005
	1676	Pos.	88·50 129·20 89·80 127·80	108·750 109·500 108·800	109·125 109·150	109·157	at div. 108 11 24 17 27 41 30 50,5	at div. 110 11 24 25 27 34,5 30 57	by div. 108 6 33,5 5 16,75	by div. 110 6 34,0 3 17,00	196,892
	1677	Neg.	127·80 85·00 126·50 86·60	106·400 105·650 106·450	106·025 106·050	106·057	at div. 106 11 34 12 57 29 40 45	at div. 108 11 34 6,5 37 35 40 39	by div. 106 6 53,0 5 16,50	by div. 108 6 32,5 5 16,25	196,495
	1678	Pos.	86·60 151·00 88·22 129·58	108·800 109·610 108·900	109·205 109·255	109·230	at div. 108 11 44 0 47 25,5 50 55	at div. 110 11 44 6 47 18 50 39	by div. 108 6 33,0 3 16,5	by div. 110 6 33,0 5 16,5	196,500
T = 50·50 B = 30·070	1679	Neg.	129·58 83·60 127·92 85·20	106·590 105·760 106·560	106·175 106·160	106·167	at div. 106 11 53 54,5 57 4 0 0 26	at div. 108 11 55 49 57 10 0 0 20,5	by div. 106 6 31,5 5 15,75	by div. 108 6 31,5 5 15,75	195,750
Feb. 13 T = 50·75 B = 30·186	1680	Pos.	101·58 115·94 102·10 115·62	108·760 109·020 108·860	108·890 108·940	108·915	at div. 108 10 35 25 36 52 59 49	at div. 110 10 35 42,5 56 55 40 7,5	by div. 108 6 24,0 3 12,0	by div. 110 6 25,0 5 12,5	192,229
	1681	Neg.	115·62 96·40 115·10 96·76	106·010 105·750 105·930	105·880 105·840	105·860	at div. 104 10 45 24 46 15 49 48	at div. 106 10 43 11,5 46 25,5 49 34,5	by div. 104 6 24,0 3 12,0	by div. 106 6 23,0 3 11,5	191,535
Continued.	1682	Pos.	96·76 120·40 97·50 119·88	108·580 108·850 108·590	108·715 108·720	108·717	at div. 108 10 52 49 56 8 59 12,5	at div. 110 10 52 59 55 57 59 25	by div. 108 6 23,5 5 11,75	by div. 110 6 24,0 5 12,00	191,840

42^{nd} SERIES continued.—2-inch *Zinc* balls, with bifilar *iron* wire; distance= ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		for Mean Resting Point.
							h m s	h m s	m s	m s	s
Continued.	1683	Neg.	119·88 91·90 119·02 92·40	105·890 105·460 105·710	105·675 105·585	105·630	at div. 104 11 2 38,5 5 36 9 2	at div. 106 11 2 30 5 45 8 53	by div. 104 6 23,5 3 11,75	by div. 106 6 23,0 3 11,50	191,546
	1684	Pos.	92·40 124·12 93·20 123·32	108·260 108·660 108·260	108·460 108·460	108·460	at div. 108 11 12 9 15 24,5 18 33	at div. 110 11 12 16,5 15 16,5 18 41	by div. 108 6 24,0 3 12,00	by div. 110 6 24,5 3 12,25	192,057
	1685	Neg.	123·32 88·08 122·28 88·84	105·700 105·180 105·560	105·440 105·370	105·405	at div. 104 11 21 54 24 56,5 28 18	at div. 106 11 21 47 25 3,5 28 11	by div. 104 6 24,0 3 12,0	by div. 106 6 24,0 3 12,0	192,000
	1686	Pos.	88·84 127·10 89·92 126·02	107·970 108·510 107·970	108·240 108·240	108·240	at div. 108 11 31 27 34 41 37 51	at div. 110 11 31 33,5 34 34,5 37 58	by div. 108 6 24,0 3 12,00	by div. 110 6 24,5 3 12,25	192,030
T=50·76 B=30·148	1687	Neg.	126·02 85·00 124·80 86·10	105·510 104·900 105·450	105·205 105·175	105·190	at div. 104 11 41 9 44 13,5 47 32,5	at div. 106 11 41 3 44 19,5 47 26	by div. 104 6 23,5 3 11,75	by div. 106 6 23,0 3 11,50	191,601

43^{rd} SERIES.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

Feb. 14 T=48·78 B=30·466	1688	Pos.	92·84 104·20 93·30 103·82	98·520 98·750 98·560	98·635 98·655	98·645	at div. 98 10 10 26 13 32,5 16 10	at div. 99 10 10 36 13 21 16 21	by div. 98 5 44,0 2 52,0	by div. 99 5 45,0 2 52,5	172,322
	1689	Neg.	103·82 89·30 103·36 89·92	96·560 96·330 96·640	96·445 96·485	96·465	at div. 96 10 19 17,5 22 2 25 3,5	at div. 97 10 19 10 22 10 24 55,5	by div. 96 5 46,0 2 53,00	by div. 97 5 45,5 2 52,75	172,884
	1690	Pos.	89·92 107·70 90·80 107·20	98·810 99·250 99·000	99·030 99·125	99·077	at div. 98 10 27 48,5 30 55 33 31,5	at div. 100 10 28 1 30 42 33 45	by div. 98 5 43,0 2 51,5	by div. 100 5 44,0 2 52,0	171,769
	1691	Neg.	107·20 86·94 106·98 87·38	97·070 96·960 97·180	97·015 97·070	97·042	at div. 96 10 36 40 39 20 42 24	at div. 98 10 36 29 39 31 42 12,5	by div. 96 5 44,0 2 52,00	by div. 98 5 43,5 2 51,75	171,870
	1692	Pos.	87·38 111·40 87·70 111·30	99·390 99·550 99·500	99·470 99·525	99·497	at div. 98 10 45 5,5 48 10 50 48	at div. 100 10 45 15 48 1 50 57,5	by div. 98 5 42,5 2 51,25	by div. 100 5 42,5 2 51,25	171,250
Continued.	1693	Neg.	111·30 83·28 110·98 83·70	97·290 97·130 97·340	97·210 97·235	97·222	at div. 96 10 53 53,5 56 36,5 59 38	at div. 98 10 53 45,5 56 44 59 29,5	by div. 96 5 44,5 2 52,25	by div. 98 5 44,0 2 52,00	172,097

43rd SERIES continued.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1694	Pos.	83·70 115·20 84·22 114·70	99·450 99·710 99·460	99·580 99·585	99·582	at div. 98 11 2 22,5 5 25 8 6,5	at div. 100 11 2 29,5 5 18 8 14	by div. 98 5 44,0 2 52,00	by div. 100 5 44,5 2 52,25	s 172,197
	1695	Neg.	114·70 80·20 113·90 80·72	97·450 97·050 97·310	97·250 97·180	97·215	at div. 96 11 11 9,5 13 54 16 53	at div. 98 11 11 3 14 0,5 16 46,5	by div. 96 5 43,5 2 51,75	by div. 98 5 43,5 2 51,75	171,750
	1696	Pos.	80·72 117·78 81·60 116·90	99·250 99·690 99·250	99·470 99·470	99·470	at div. 98 11 19 39 22 39 25 22,5	at div. 100 11 19 45 22 32 25 29	by div. 98 5 43,5 2 51,75	by div. 100 5 44,0 2 52,00	171,934
	1697	Neg.	116·90 77·90 115·70 78·94	97·400 96·800 97·320	97·100 97·060	97·080	at div. 96 11 28 21,5 31 8 34 6	at div. 98 11 28 16 31 13,5 34 0	by div. 96 5 44,5 2 52,25	by div. 98 5 44,0 2 52,00	172,115
	1698	Pos.	78·94 119·00 80·10 117·88	98·970 99·550 98·990	99·260 99·270	99·265	at div. 98 11 36 53 39 52 42 36	at div. 100 11 36 58,5 39 46 42 42	by div. 98 5 43,0 2 51,50	by div. 100 5 43,5 2 51,75	171,658
T=48·78 B=30·490	1699	Neg.	117·88 76·80 116·50 78·00	97·340 96·650 97·250	96·995 96·950	96·972	at div. 96 11 45 35,5 48 22 51 19	at div. 98 11 45 30,5 48 27,5 51 13,5	by div. 96 5 43,5 2 51,75	by div. 98 5 43,0 2 51,50	171,629
Feb. 15 T=48·97 B=30·502	1700	Pos.	92·92 102·08 93·60 101·70	97·500 97·840 97·650	97·670 97·745	97·707	at div. 97 9 47 13 50 25,5 53 0	at div. 98 9 47 25,5 50 13 53 14	by div. 97 5 47,0 2 53,50	by div. 98 5 48,5 2 54,25	174,030
	1701	Neg.	101·70 89·54 100·80 90·34	95·620 95·170 95·570	95·395 95·370	95·382	at div. 95 9 56 17 59 3,5 10 2 6	at div. 96 9 56 7,5 59 14 10 1 55	by div. 95 5 49,0 2 54,50	by div. 96 5 47,5 2 53,75	174,214
	1702	Pos.	90·34 104·62 91·32 103·70	97·480 97·970 97·510	97·725 97·740	97·732	at div. 96 10 4 48 8 11 10 35	at div. 98 10 5 3 7 54 10 53	by div. 96 5 47,0 2 53,5	by div. 98 5 50,0 2 55,0	174,799
	1703	Neg.	103·70 87·60 102·60 88·34	95·650 95·100 95·470	95·375 95·285	95·330	at div. 94 10 13 58,5 16 34 19 48	at div. 96 10 13 44,5 16 49 19 32,5	by div. 94 5 49,5 2 54,75	by div. 96 5 48,0 2 54,00	174,252
	1704	Pos.	88·34 106·08 89·58 104·94	97·210 97·830 97·260	97·520 97·545	97·532	at div. 96 10 22 30 25 45,5 28 19,5	at div. 98 10 22 42,5 25 32 28 34	by div. 96 5 49,5 2 54,75	by div. 98 5 51,5 2 55,75	175,516
Continued.	1705	Neg.	104·94 85·90 93·68 87·00	95·420 94·790 95·340	95·105 95·065	95·085	at div. 94 10 31 34 34 16,5 37 25,5	at div. 96 10 31 22,5 34 29 37 12,5	by div. 94 5 51,5 2 55,75	by div. 96 5 50,0 2 55,00	175,344

43rd Series continued.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1706	Pos.	87·00 107·20 88·32 105·90	97·100 97·760 97·110	97·430 97·435	97·432	at div. 96 10 40 10 43 22,5 46 1,5	at div. 98 10 40 21 43 10,5 46 14	by div. 96 5 51,5 2 55,75	by div. 98 5 53,0 2 56,50	* 176,287
T = 49·17 B = 30·496	1707	Neg.	105·90 84·74 104·68 85·78	95·320 94·710 95·230	95·015 94·970	94·992	at div. 94 10 49 13,5 51 58 55 5	at div. 96 10 49 3 52 9,5 54 53	by div. 94 5 51,5 2 55,75	by div. 96 5 50,0 2 55,00	175,378

44th Series.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·415 inch.

Feb. 16 T = 49·80 B = 30·550	1708	Pos.	101·74 114·02 102·54 113·26	107·880 108·280 107·900	108·080 108·090	108·085	at div. 108 9 44 34,5 47 43,5 50 48,5	at div. 109 9 44 44 47 33 51 0	by div. 108 6 14,0 3 7,0	by div. 109 6 16,0 3 8,0	187,085
	1709	Neg.	113·26 97·80 112·10 98·48	105·530 104·950 105·290	105·240 105·120	105·180	at div. 105 9 54 3 57 7 10 0 16	at div. 106 9 53 55 57 15,5 10 0 7	by div. 105 6 13,0 3 6,5	by div. 106 6 12,0 3 6,0	186,410
	1710	Pos.	98·48 116·48 99·48 115·28	107·480 107·980 107·380	107·730 107·680	107·705	at div. 106 10 3 15 6 46 9 29	at div. 108 10 3 28,5 6 31,5 9 44,5	by div. 106 6 14,0 3 7,0	by div. 108 6 16,0 3 8,0	187,852
	1711	Neg.	115·28 94·90 113·80 95·50	105·090 104·350 104·650	104·720 104·500	104·610	at div. 104 10 12 57 15 56 19 9,5	at div. 106 10 12 45 16 8,5 18 56	by div. 104 6 12,5 3 6,25	by div. 106 6 11,0 3 5,50	186,022
	1712	Pos.	95·50 117·50 96·54 116·00	106·500 107·020 106·270	106·760 106·645	106·702	at div. 106 10 22 14,5 25 30 28 30	at div. 108 10 22 25,5 25 18,5 28 42	by div. 106 6 15,5 3 7,75	by div. 108 6 16,5 3 8,25	187,925
	1713	Neg.	116·00 92·00 114·50 92·90	104·000 103·250 103·700	103·625 103·475	103·550	at div. 102 10 31 51 34 43 38 5	at div. 104 10 31 41 34 53,5 37 54	by div. 102 6 14,0 3 7,0	by div. 104 6 13,0 3 6,5	186,613
	1714	Pos.	92·90 118·30 93·92 116·70	105·600 106·110 105·310	105·855 105·710	105·782	at div. 104 10 41 0 44 26 47 17	at div. 106 10 41 10 44 16 47 28	by div. 104 6 17,0 3 8,5	by div. 106 6 18,0 3 9,0	188,945
	1715	Neg.	116·70 89·32 115·00 91·00	103·010 102·160 103·000	102·585 102·580	102·582	at div. 102 10 50 41 53 46,5 57 3	at div. 104 10 50 32 53 56 56 53	by div. 102 6 22,0 3 11,0	by div. 104 6 21,0 3 10,5	190,855
Continued.	1716	Pos.	91·00 119·54 93·00 118·16	105·270 106·270 105·580	105·770 105·925	105·847	at div. 104 11 0 9 3 38 6 33,5	at div. 106 11 0 17,5 3 29 6 43,5	by div. 104 6 24,5 3 12,25	by div. 106 6 26,0 3 13,00	192,942

44th Series continued.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1717	Neg.	118·16 89·20 116·70 91·10	105·680 102·950 103·900	103·315 105·425	103·370	at div. 102 11 10 5 15 8 16 35	at div. 104 11 9 56 13 17 16 25	by div. 102 6 30,0 3 15,0	by div. 104 6 29,0 3 14,5	• 194,658
	1718	Pos.	91·10 121·12 93·50 119·80	106·110 107·210 106·550	106·660 106·880	106·770	at div. 106 11 19 45 25 3,5 26 11	at div. 108 11 19 51 22 54,5 26 20	by div. 106 6 28,0 5 14,0	by div. 108 6 29,0 3 14,5	194,192
T = 50·07 B = 30·558	1719	Neg.	119·80 89·48 118·30 91·60	104·640 103·890 104·950	104·265 104·420	104·342	at div. 104 11 29 32 32 45 56 4	at div. 106 11 29 23,5 52 54 35 54	by div. 104 6 32,0 3 16,00	by div. 106 6 30,5 5 15,25	195,872
Feb. 17 T = 50·11 B = 30·416	1720	Pos.	100·50 112·90 101·18 112·14	106·600 107·040 106·660	106·820 106·850	106·835	at div. 106 10 2 41 6 3,5 8 55	at div. 107 10 2 50,5 5 53 9 4	by div. 106 6 12,0 3 6,00	by div. 107 6 15,5 3 6,75	186,625
	1721	Neg.	112·14 96·48 110·90 97·00	104·310 103·690 105·950	104·000 103·820	105·910	at div. 103 10 12 24 15 16 18 35	at div. 104 10 12 16 15 24 18 26,5	by div. 103 6 11,0 3 5,50	by div. 104 6 10,5 5 5,25	185,275
	1722	Pos.	97·00 115·24 98·10 114·00	106·120 106·670 106·050	106·595 106·560	106·377	at div. 106 10 21 39 24 51 27 53,5	at div. 108 10 21 52,5 24 37 28 9	by div. 106 6 14,5 3 7,25	by div. 108 6 16,5 5 8,25	187,438
	1725	Neg.	114·00 95·60 112·56 94·28	103·800 103·080 103·420	105·440 105·250	103·345	at div. 102 10 31 15 34 6 37 29	at div. 104 10 31 3 34 18,5 57 16	by div. 102 6 14,0 5 7,0	by div. 104 6 13,0 5 6,5	186,664
	1724	Pos.	94·28 116·40 95·30 115·00	105·340 105·850 105·150	105·595 105·500	105·547	at div. 104 10 40 25 43 49 46 59	at div. 106 10 40 36 43 58 46 51,5	by div. 104 6 14,0 3 7,00	by div. 106 6 15,5 3 7,75	187,580
	1725	Neg.	115·00 90·74 113·32 91·60	102·870 102·030 102·460	102·450 102·245	102·347	at div. 102 10 50 1 55 5 56 14	at div. 104 10 49 51 55 15,5 56 3	by div. 102 6 13,0 3 6,5	by div. 104 6 12,0 5 6,0	186,413
	1726	Pos.	91·60 117·26 92·76 115·74	104·450 105·010 104·250	104·720 104·630	104·675	at div. 104 10 59 21 11 2 35 5 58	at div. 106 10 59 50 11 2 25 5 48	by div. 104 6 17,0 3 8,5	by div. 106 6 18,0 3 9,0	188,669
T = 50·25 B = 30·402	1727	Neg.	115·74 88·50 114·22 90·08	102·020 101·260 102·150	101·640 101·705	101·672	at div. 100 11 8 58 11 54 15 21	at div. 102 11 8 49 12 3,5 15 11	by div. 100 6 23,0 5 11,5	by div. 102 6 22,0 3 11,0	191,082

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1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Feb. 18 T=47·68 B=30·376	1728	Pos.	102·30 111·00 103·68 109·88	106·650 107·340 106·780	106·995 107·060	107·027	at div. 107 9 42 1,5 44 46 47 33	at div. 108 9 42 14 44 31 47 50	by div. 107 5 31,5 2 45,75	by div. 108 5 36,0 2 48,00	• 165,211
	1729	Neg.	109·88 100·50 108·40 101·60	105·190 104·450 105·000	104·820 104·725	104·772	at div. 104 9 50 33 53 0 56 7	at div. 105 9 50 22 53 13 55 52	by div. 104 5 34,0 2 47,0	by div. 105 5 30,0 2 45,0	165,456
	1730	Pos.	101·60 111·50 103·20 110·40	106·550 107·350 106·800	106·950 107·075	107·012	at div. 107 9 58 49 10 1 35 4 19,5	at div. 108 9 59 0 10 1 23 4 35	by div. 107 5 30,5 2 45,25	by div. 108 5 35,0 2 47,50	165,277
	1731	Neg.	110·40 100·40 109·04 101·52	105·400 104·720 105·280	105·060 105·000	105·030	at div. 105 10 7 14 9 59,5 12 46,5	at div. 106 10 7 3 10 12,5 12 32	by div. 105 5 32,5 2 46,25	by div. 106 5 29,0 2 44,50	166,198
	1732	Pos.	101·52 112·30 102·88 111·30	106·910 107·590 107·090	107·250 107·340	107·295	at div. 107 10 15 37 18 29 21 8	at div. 108 10 15 47 18 18 21 21	by div. 107 5 31,0 2 45,5	by div. 108 5 34,0 2 47,0	165,942
	1733	Neg.	111·30 99·98 109·84 101·00	105·640 104·910 105·420	105·275 105·165	105·220	at div. 105 10 24 7 26 49 29 39,5	at div. 106 10 23 57 27 0 29 27	by div. 105 5 32,5 2 46,25	by div. 106 5 30,0 2 45,00	165,975
	1734	Pos.	101·00 112·84 102·40 111·70	106·920 107·620 107·050	107·270 107·335	107·302	at div. 107 10 32 27,5 35 20 38 0,5	at div. 108 10 32 36,5 35 9,5 38 11,5	by div. 107 5 33,0 2 46,5	by div. 108 5 35,0 2 47,5	166,802
	1735	Neg.	111·70 99·30 110·32 100·34	105·500 104·810 105·330	105·155 105·070	105·112	at div. 105 10 40 56 43 41 46 29,5	at div. 106 10 40 47 43 51 46 19	by div. 105 5 33,5 2 46,75	by div. 106 5 32,0 2 46,00	166,666
	1736	Pos.	100·34 113·02 101·80 111·90	106·680 107·410 106·850	107·045 107·130	107·087	at div. 107 10 49 22 52 10,5 54 56	at div. 108 10 49 30,5 52 1 55 6,5	by div. 107 5 34,0 2 47,0	by div. 108 5 36,0 2 48,0	167,087
	1737	Neg.	111·90 98·74 110·32 99·90	105·320 104·530 105·110	104·925 104·820	104·872	at div. 104 10 57 55 11 0 27 3 29	at div. 105 10 57 47 11 0 36 3 19	by div. 104 5 34,0 2 47,0	by div. 105 5 32,0 2 46,0	166,128
	1738	Pos.	99·90 113·12 101·14 112·00	106·510 107·130 106·570	106·820 106·850	106·835	at div. 106 11 6 6 9 7 11 38,5	at div. 107 11 6 14 8 58 11 48,5	by div. 106 5 32,5 2 46,25	by div. 107 5 34,5 2 47,25	167,085
T=47·58 B=30·396	1739	Neg.	112·00 98·12 110·50 99·20	105·060 104·310 104·850	104·685 104·580	104·632	at div. 104 11 14 42,5 17 19 20 17	at div. 105 11 14 35 17 28 20 7,5	by div. 104 5 34,5 2 47,25	by div. 105 5 32,5 2 46,25	166,618

45th SERIES continued.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Feb. 19 T=44·28 B=30·400	1740	Pos.	93·50 104·10 94·60 102·96	98·800 99·350 98·780	99·075 99·065	99·070	at div. 99 10 16 9,5 19 21 22 10	at div. 100 10 16 40 19 10 22 23	by div. 99 5 40,5 2 50,25	by div. 100 5 43,0 2 51,50	s 170,337
	1741	Neg.	102·96 91·60 102·40 93·20	97·280 97·000 97·800	97·140 97·400	97·270	at div. 97 10 25 3 27 54 30 58	at div. 98 10, 24 53 28 4 30 46	by div. 97 5 55,0 2 57,5	by div. 98 5 53,0 2 56,5	177,230
	1742	Pos.	93·20 105·92 95·00 104·84	99·560 100·460 99·920	100·010 100·190	100·100	at div. 100 10 33 51 36 51 39 35	at div. 101 10 34 0 36 41 39 47	by div. 100 5 44,0 2 52,0	by div. 101 5 47,0 2 53,5	172,150
	1743	Neg.	104·84 92·80 103·90 94·00	98·820 98·350 98·950	98·585 98·650	98·617	at div. 98 10 42 43 45 19 48 34,5	at div. 99 10 42 34 45 30 48 23	by div. 98 5 51,5 2 55,75	by div. 99 5 49,0 2 54,50	174,979
	1744	Pos.	94·00 107·30 95·10 106·00	100·650 101·200 100·550	100·925 100·875	100·900	at div. 100 10 51 18 54 33 57 8	at div. 101 10 51 28 54 24 57 19	by div. 100 5 50,0 2 55,0	by div. 101 5 51,0 2 55,5	175,450
	1745	Neg.	106·00 92·10 104·90 93·80	99·050 98·500 99·350	98·775 98·925	98·850	at div. 98 11 0 21 2 57 6 7	at div. 99 11 0 13 3 5 5 56	by div. 98 5 46,0 2 53,0	by div. 99 5 43,0 2 51,5	171,725
	1746	Pos.	93·80 108·40 94·00 107·90	101·100 101·200 100·950	101·150 101·075	101·112	at div. 101 11 8 50 11 44 14 35	at div. 102 11 8 57 11 36 14 43	by div. 101 5 45,0 2 52,5	by div. 102 5 46,0 2 53,0	172,556
T=44·17 B=30·382	1747	Neg.	107·90 90·08 106·90 91·08	98·990 98·490 98·990	98·740 98·740	98·740	at div. 98 11 17 33 20 15 23 14	at div. 99 11 17 27 20 22 23 7	by div. 98 5 41,0 2 50,5	by div. 99 5 40,0 2 50,0	170,130

46th SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

Feb. 20 T=42·87 B=30·030	1748	Pos.	56·00 140·30 58·00 138·30	98·150 99·150 98·150	98·650 98·650	98·650	at div. 95 11 30 36 34 14,5 37 30	at div. 100 11 30 44 34 6,5 37 38	by div. 95 6 54,0 3 27,0	by div. 100 6 54,0 3 27,0	207,000
	1749	Neg.	138·30 52·94 136·18 54·80	95·620 94·560 95·490	95·090 95·025	95·057	at div. 95 11 41 4 44 31 47 58	at div. 100 11 40 56 44 39 47 50	by div. 95 6 54,0 3 27,0	by div. 100 6 54,0 3 27,0	207,000
Continued.	1750	Pos.	54·80 141·30 56·74 139·28	98·050 99·020 98·010	98·535 98·515	98·525	at div. 95 11 51 21 54 59 58 15,5	at div. 100 11 51 29 54 51 58 23,5	by div. 95 6 54,5 3 27,25	by div. 100 6 54,5 3 27,25	207,250

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1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1751	Neg.	139·28 51·60 137·10 53·46	95·440 94·350 95·280	94·895 94·815	94·855	at div. 90 0 1 56,5 5 8 8 51	at div. 95 0 1 48,5 5 16,5 8 43	by div. 90 6 54,5 3 27,25	by div. 95 6 54,5 3 27,25	* 207,250
	1752	Pos.	53·46 142·20 55·50 140·12	97·830 98·850 97·810	98·340 98·330	98·335	at div. 95 0 12 7 15 44 19 1	at div. 100 0 12 14,5 15 36,5 19 9	by div. 95 6 54,0 3 27,00	by div. 100 6 54,5 3 27,25	207,167
T=42·93 B=30·000	1753	Neg.	140·12 50·30 138·02 52·20	95·210 94·160 95·110	94·685 94·635	94·660	at div. 90 0 22 42 25 54,5 29 36	at div. 95 0 22 34,5 26 2 29 28	by div. 90 6 54,0 3 27,00	by div. 95 6 53,5 3 26,75	206,767
Feb. 21 T=41·85 B=29·782	1754	Pos.	92·80 107·80 93·24 107·50	100·300 100·520 100·370	100·410 100·445	100·427	at div. 100 9 57 50 10 1 36 4 46	at div. 102 9 58 8 10 1 7 5 5	by div. 100 6 56,0 3 28,0	by div. 102 6 57,0 3 28,5	208,107
	1755	Neg.	107·50 86·60 106·90 87·02	97·050 96·750 96·960	96·900 96·855	96·877	at div. 96 10 8 28 11 45 15 25	at div. 98 10 8 15,5 11 58,5 15 11,5	by div. 96 6 57,0 3 28,5	by div. 98 6 56,0 3 28,0	208,281
	1756	Pos.	87·02 113·50 87·76 112·84	100·260 100·630 100·300	100·445 100·465	100·455	at div. 100 10 18 49 22 22 25 46	at div. 105 10 19 15 21 56 26 13	by div. 100 6 57,0 3 28,5	by div. 105 6 58,0 3 29,0	208,545
	1757	Neg.	112·84 81·20 112·00 81·78	97·020 96·600 96·890	96·810 96·745	96·777	at div. 95 10 29 27,5 32 40 36 24	at div. 100 10 29 6 33 2 36 2	by div. 95 6 56,5 3 28,25	by div. 100 6 56,0 3 28,00	208,161
	1758	Pos.	81·78 118·28 82·50 117·30	100·030 100·390 99·900	100·210 100·145	100·177	at div. 100 10 39 46,5 43 16 46 44	at div. 105 10 40 5 42 58 46 3,5	by div. 100 6 57,5 3 28,75	by div. 105 6 58,5 3 29,25	208,768
	1759	Neg.	117·30 76·02 116·28 76·60	96·660 96·150 96·440	96·405 96·295	96·350	at div. 95 10 50 20 53 40 57 17	at div. 100 10 50 3,5 53 57 57 0	by div. 95 6 57,0 3 28,50	by div. 100 6 56,5 3 28,25	208,432
	1760	Pos.	76·60 122·32 77·62 121·30	99·460 99·970 99·460	99·715 99·715	99·715	at div. 95 11 0 31 4 28 7 28	at div. 100 11 0 46 4 13 7 44	by div. 95 6 57,0 3 28,5	by div. 100 6 58,0 3 29,0	208,971
	1761	Neg.	121·30 71·30 120·04 72·12	96·300 95·670 96·080	95·985 95·875	95·930	at div. 95 11 11 16 14 39 18 14	at div. 100 11 11 2,5 14 53,5 17 59,5	by div. 95 6 58,0 3 29,0	by div. 100 6 57,0 3 28,5	208,907
Continued.	1762	Pos.	72·12 126·00 73·40 124·96	99·060 99·700 99·180	99·380 99·440	99·410	at div. 95 11 21 31 25 22,5 28 29	at div. 100 11 21 43,5 25 10 28 42	by div. 95 6 58,0 3 29,00	by div. 100 6 58,5 3 29,25	209,220

46th SERIES continued.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1763	Neg.	124·96 67·32 123·70 68·50	96·140 95·510 96·110	95·825 95·805	95·815	at div. 95 11 32 14 35 40 39 13,5	at div. 100 11 32 2 35 52 39 1,5	by div. 95 6 59,5 3 29,75	by div. 100 6 59,5 3 29,75	209,750
	1764	Pos.	68·50 129·80 69·84 128·80	99·150 99·820 99·320	99·485 99·570	99·527	at div. 95 11 42 34 46 24 49 33,5	at div. 100 11 42 45 46 13 49 45	by div. 95 6 59,5 3 29,75	by div. 100 7 0,0 3 30,00	209,976
	1765	Neg.	128·80 64·06 127·70 65·62	96·430 95·880 96·660	96·155 96·270	96·212	at div. 95 11 53 18 56 43,5 0 0 20	at div. 100 11 53 8 56 32,5 0 0 9	by div. 95 7 2,0 3 31,0	by div. 100 7 1,0 3 30,5	210,879
	1766	Pos.	65·62 133·78 67·50 132·58	99·700 100·640 100·040	100·170 100·340	100·255	at div. 100 0 3 49,5 7 20 10 50	at div. 105 0 3 59 7 10 11 0,5	by div. 100 7 0,5 3 30,25	by div. 105 7 1,5 3 30,75	210,275
T = 42·31 B = 29·724	1767	Neg.	132·58 61·80 131·00 63·50	97·190 96·400 97·250	96·795 96·825	96·810	at div. 95 0 14 26,5 17 51 21 30	at div. 100 0 14 17 18 1 21 20	by div. 95 7 3,5 3 31,75	by div. 100 7 3,0 3 31,50	211,660

47th SERIES.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
Feb. 22 T = 42·90 B = 29·772	1768	Pos.	96·62 111·80 97·30 111·14	104·210 104·550 104·220	104·380 104·385	104·382	at div. 104 9 44 53 48 20 51 32,5	at div. 105 9 45 1,5 48 11 51 42	by div. 104 6 39,5 3 19,75	by div. 105 6 40,5 3 20,25	199,941
	1769	Neg.	111·14 91·36 110·34 91·80	101·250 100·850 101·070	101·050 100·960	101·005	at div. 101 9 55 0,5 58 20 10 1 38,5	at div. 102 9 54 54 58 26,5 10 1 31,5	by div. 101 6 38,0 3 19,00	by div. 102 6 37,5 3 18,75	198,999
	1770	Pos.	91·80 115·80 92·24 115·00	103·800 104·020 103·620	103·910 103·820	103·865	at div. 100 10 4 43 8 45 11 22	at div. 105 10 5 10 8 17,5 11 51	by div. 100 6 39,0 3 19,5	by div. 105 6 41,0 3 20,5	200,273
	1771	Neg.	115·00 86·40 113·90 87·28	100·700 100·150 100·590	100·425 100·370	100·397	at div. 100 10 15 8 18 25 21 47	at div. 105 10 14 46 18 48 21 22	by div. 100 6 39,0 3 19,5	by div. 105 6 36,0 3 18,0	199,381
	1772	Pos.	87·28 119·40 88·20 118·40	103·340 103·800 103·300	103·570 103·550	103·560	at div. 100 10 24 54 28 43 31 33	at div. 105 10 25 14 28 22,5 31 54	by div. 100 6 39,0 3 19,5	by div. 105 6 40,0 3 20,0	199,856
Continued.	1773	Neg.	118·40 82·50 117·10 83·30	100·450 99·800 100·200	100·125 100·000	100·062	at div. 100 10 35 11 38 30 41 51	at div. 105 10 34 53 38 49 41 32	by div. 100 6 40,0 3 20,0	by div. 105 6 39,0 3 19,5	199,994

47th Series continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1774	Pos.	83·30 122·50 84·54 121·52	102·900 103·520 103·030	103·210 103·275	103·242	at div. 100 10 45 5 48 50 51 49,5	at div. 105 10 45 22 48 33 52 7,5	by div. 100 6 44,5 3 22,25	by div. 105 6 45,5 3 22,75	* 202,574
	1775	Neg.	121·52 79·30 120·40 80·80	100·410 99·850 100·600	100·130 100·225	100·177	at div. 100 10 55 28 58 51 11 2 16,5	at div. 105 10 55 13 59 7 11 2 0	by div. 100 6 48,5 3 24,25	by div. 105 6 47,0 3 23,50	204,224
	1776	Pos.	80·80 126·00 82·50 124·94	103·400 104·250 103·720	103·825 103·985	103·905	at div. 100 11 5 31 9 18 12 18	at div. 105 11 5 45 9 3 12 33	by div. 100 6 47,0 3 23,5	by div. 105 6 48,0 3 24,0	203,890
	1777	Neg.	124·94 77·42 123·80 79·00	101·180 100·610 101·400	100·895 101·005	100·950	at div. 100 11 15 58,5 19 18 22 48	at div. 105 11 15 45 19 32 22 33,5	by div. 100 6 49,5 3 24,75	by div. 105 6 48,5 3 24,25	204,655
	1778	Pos.	79·00 129·28 80·98 127·92	104·140 105·130 104·450	104·635 104·790	104·712	at div. 100 11 25 59,5 29 49 32 47	at div. 105 11 26 12,5 29 35 33 1	by div. 100 6 47,5 3 23,75	by div. 105 6 48,5 3 24,25	204,221
T = 43·30 B = 29·728	1779	Neg.	127·92 76·30 126·32 78·24	102·110 101·310 102·280	101·710 101·795	101·752	at div. 100 11 36 32 39 48 43 22,5	at div. 105 11 36 19 40 1 43 9	by div. 100 6 50,5 3 25,25	by div. 105 6 50,0 3 25,00	205,162
Feb. 23 T = 45·07 B = 29·440	1780	Pos.	95·40 111·20 96·00 110·80	103·300 103·600 103·400	103·450 103·500	103·475	at div. 103 9 51 56 55 28 58 44	at div. 104 9 52 4 55 20 58 53	by div. 103 6 48,0 3 24,0	by div. 104 6 49,0 3 24,5	204,237
	1781	Neg.	110·80 89·98 110·06 90·62	100·390 100·020 100·340	100·205 100·180	100·192	at div. 100 10 2 17,5 5 40 9 7	at div. 101 10 2 11 5 47 9 0	by div. 100 6 49,5 3 24,75	by div. 101 6 49,0 3 24,50	204,702
	1782	Pos.	90·62 116·04 91·70 115·32	103·330 103·870 103·510	103·600 103·690	103·645	at div. 100 10 12 15 16 18,5 19 2,5	at div. 105 10 12 41 15 51,5 19 30	by div. 100 6 47,5 3 23,75	by div. 105 6 49,0 3 24,50	204,297
	1783	Neg.	115·32 85·94 114·50 87·10	100·630 100·220 100·800	100·425 100·510	100·467	at div. 100 10 22 53 26 14 29 43	at div. 105 10 22 30,5 26 37 29 19	by div. 100 6 50,0 3 25,00	by div. 105 6 48,5 3 24,25	204,930
	1784	Pos.	87·10 120·40 88·58 119·60	103·750 104·490 104·090	104·120 104·290	104·205	at div. 100 10 32 52 36 30 39 40	at div. 105 10 33 12 36 9 40 1	by div. 100 6 48,0 3 24,0	by div. 105 6 49,0 3 24,5	204,420
Contiuued.	1785	Neg.	119·60 83·12 118·60 84·56	101·360 100·860 101·580	101·110 101·220	101·165	at div. 100 10 43 29 46 46 50 20	at div. 105 10 43 11 47 4,5 50 1	by div. 100 6 51,0 3 25,5	by div. 105 6 50,0 3 25,0	205,384

47th SERIES continued.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1786	Pos.	84·56 124·30 86·50 123·20	104·450 105·400 104·850	104·915 105·125	105·020	at div. 105 10 55 45 57 7 11 0 52	at div. 110 10 54 0 56 50 11 0 50	by div. 105 6 49,0 3 24,5	by div. 110 6 50,0 5 25,0	• 204,502
T=45·28 B=29·410	1787	Neg.	123·20 81·08 121·90 82·80	102·140 101·490 102·550	101·815 101·920	101·867	at div. 100 11 4 4,5 7 18 10 56	at div. 105 11 5 49 7 34 10 39	by div. 100 6 51,5 5 25,75	by div. 105 6 50,0 3 25,00	205,470

48th SERIES.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

Feb. 25 T=46·78 B=29·256	1788	Pos.	75·82 133·90 77·34 132·72	104·860 105·620 105·030	105·240 105·525	105·282	at div. 105 9 55 45 10 2 10 8 32	at div. 110 9 56 4,5 10 1 48,5 8 54	by div. 105 12 49,0 6 24,50	by div. 110 12 49,5 6 24,75	384,514
	1789	Neg.	132·72 54·96 130·90 56·70	95·840 92·930 95·800	95·385 95·565	93·575	at div. 90 10 15 14 21 17 28 4	at div. 95 10 14 58 21 35,5 27 47,5	by div. 90 12 50,0 6 25,00	by div. 95 12 49,5 6 24,75	584,851
	1790	Pos.	56·70 152·70 59·12 149·74	104·700 105·910 104·450	105·505 105·170	105·257	at div. 105 10 54 22 40 47 47 11,5	at div. 110 10 54 55 40 54 47 25	by div. 105 12 49,5 6 24,75	by div. 110 12 50,0 6 25,00	384,762
	1791	Neg.	149·74 57·70 145·80 40·20	93·720 91·750 95·000	92·735 92·575	92·555	at div. 90 10 43 45 59 57 11 6 31	at div. 95 10 55 34 11 0 8,5 6 19,5	by div. 90 12 46,0 6 23,00	by div. 95 12 45,5 6 22,75	582,872
	1792	Pos.	40·20 165·80 43·08 162·48	105·000 104·440 102·780	105·720 103·610	105·665	at div. 100 11 12 44 19 20 25 27	at div. 105 11 12 54 19 10,5 25 57	by div. 100 12 45,0 6 21,5	by div. 105 12 45,0 6 21,5	581,500
	1793	Neg.	162·48 22·40 158·72 26·02	92·440 90·560 92·370	91·500 91·465	91·482	at div. 90 11 31 59,5 38 15,5 44 42,5	at div. 95 11 31 50,5 38 24,5 44 53	by div. 90 12 45,0 6 21,50	by div. 95 12 42,5 6 21,25	581,426
	1794	Pos.	26·02 178·58 31·08 174·60	102·500 104·830 102·840	103·565 103·855	103·700	at div. 100 11 50 59 57 55 0 3 47	at div. 105 11 51 7,5 57 27 0 5 56	by div. 100 12 48,0 6 24,00	by div. 105 12 48,5 6 24,25	584,185
T=46·68 B=29·500	1795	Neg.	174·60 12·20 169·80 17·90	95·400 91·000 95·850	92·200 92·425	92·512	at div. 90 0 10 28 16 51 25 34	at div. 95 0 10 20,5 16 59 25 26	by div. 90 15 6,0 0 55,00	by div. 95 13 5,5 6 52,75	592,884
Feb. 26 T=44·41 B=29·418 Continued.	1796	Pos.	89·98 155·30 91·40 152·92	112·640 113·550 112·160	112·995 112·755	112·875	at div. 110 9 47 14 54 10 10 0 3	at div. 115 9 47 41 55 42 10 0 32	by div. 110 12 49,0 6 24,5	by div. 115 12 51,0 6 25,5	385,075

48th SERIES continued.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1797	Neg.	132·92 69·10 129·12 70·94	101·010 99·110 100·030	100·060 99·570	99·815	at div. 95 10 7 7 12 53 19 58,5	at div. 100 10 6 48 13 14 19 37	by div. 95 12 51,5 6 25,75	by div. 100 12 49,0 6 24.50	• 384,546
	1798	Pos.	70·94 148·90 73·80 143·90	109·910 111·350 108·850	110·635 110·100	110·367	at div. 110 10 26 9 32 37 39 3	at div. 115 10 26 25 32 21 39 20,5	by div. 110 12 54,0 6 27,00	by div. 115 12 55,5 6 27,75	387,055
	1799	Neg.	143·90 52·08 137·68 55·20	97·990 94·880 96·440	96·435 95·660	96·047	at div. 95 10 45 33 51 51 58 18	at div. 100 10 45 19,5 52 5 58 3,5	by div. 95 12 45,0 6 22,5	by div. 100 12 44,0 6 22,0	382,395
	1800	Pos.	55·20 154·98 57·80 150·30	105·090 106·390 104·050	105·740 105·220	105·480	at div. 105 11 4 41,5 11 5 17 25	at div. 110 11 4 54 10 53 17 38,5	by div. 105 12 43,5 6 21,75	by div. 110 12 44,5 6 22,25	381,798
T = 44·41 B = 29·450	1801	Neg.	150·30 36·70 145·12 39·64	93·500 90·910 92·380	92·205 91·645	91·925	at div. 90 11 23 53,5 30 3,5 36 30,5	at div. 95 11 23 43 30 14,5 36 19	by div. 90 12 37,0 6 18,5	by div. 95 12 36,0 6 18,0	378,308
Feb. 27 T = 43·20 B = 29·514	1802	Pos.	79·42 127·04 81·50 124·90	103·230 104·270 103·200	103·750 103·735	103·742	at div. 100 9 45 11 52 13 57 54	at div. 105 9 45 36,5 51 46 58 22	by div. 100 12 43,0 6 21,50	by div. 105 12 45,5 6 22,75	382,435
	1803	Neg.	124·90 59·62 121·92 61·18	92·260 90·770 91·550	91·515 91·160	91·337	at div. 90 10 4 48 10 58 17 28	at div. 95 10 4 29,5 11 17 17 8	by div. 90 12 40,0 6 20,00	by div. 95 12 38,5 6 19,25	379,799
	1804	Pos.	61·18 142·26 63·12 138·60	101·720 102·690 100·860	102·205 101·775	101·990	at div. 100 10 23 44 30 17,5 36 27,5	at div. 105 10 23 59 30 2 36 43,5	by div. 100 12 43,5 6 21,75	by div. 105 12 44,5 6 22,25	381,949
	1805	Neg.	138·60 41·72 133·80 44·10	90·160 87·760 88·950	88·960 88·355	88·657	at div. 85 10 43 7 49 8 55 46,5	at div. 90 10 42 55 49 21 55 33,5	by div. 85 12 39,5 6 19,75	by div. 90 12 38,5 6 19,25	379,384
	1806	Pos.	44·10 152·68 48·50 147·40	98·390 100·590 97·950	99·490 99·270	99·380	at div. 95 11 1 53 8 35 14 36	at div. 100 11 2 4 8 23 14 48	by div. 95 12 43,0 6 21,5	by div. 100 12 44,0 6 22,0	381,938
T = 43·38 B = 29·428	1807	Neg.	147·40 30·70 143·08 36·20	89·050 86·890 89·640	87·970 88·265	88·117	at div. 85 11 21 15,5 27 24 33 58	at div. 90 11 21 5 27 34,5 33 46,5	by div. 85 12 42,5 6 21,25	by div. 90 12 41,5 6 20,75	380,938

49th SERIES.—2-inch *Zinc* balls, with *single* copper wire; diameter = ·0178 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Feb. 28 T=43·60 B=29·634	1808	Pos.	96·34 132·00 98·30 130·12	114·170 115·150 114·210	114·660 114·680	114·670	at div. 110 9 48 15 54 21 58 36	at div. 115 9 48 43,5 53 51,5 59 7,5	by div. 110 10 21,0 5 10,5	by div. 115 10 24,0 5 12,0	* 311,901
	1809	Neg.	130·12 84·52 127·50 86·12	107·320 106·010 106·810	106·665 106·410	106·537	at div. 105 10 4 31 9 29 14 54,5	at div. 110 10 4 9 9 52 14 30	by div. 105 10 23,5 5 11,75	by div. 110 10 21,0 5 10,50	311,366
	1810	Pos.	86·12 139·90 88·70 137·40	113·010 114·300 113·050	113·655 113·675	113·665	at div. 110 10 19 52 25 31 30 15,5	at div. 115 10 20 10,5 25 12 30 36	by div. 110 10 23,5 5 11,75	by div. 115 10 25,5 5 12,75	312,483
	1811	Neg.	137·40 75·54 134·32 77·48	106·470 104·930 105·900	105·700 105·415	105·557	at div. 105 10 35 46,5 40 56 46 14	at div. 110 10 35 30 41 13 45 56	by div. 105 10 27,5 5 13,75	by div. 110 10 26,0 5 13,00	313,666
	1812	Pos.	77·48 148·10 81·30 146·10	112·790 114·700 113·700	113·745 114·200	113·972	at div. 110 10 51 24 57 10 11 2 8,5	at div. 115 10 51 38,5 56 54,5 11 2 25	by div. 110 10 44,5 5 22,25	by div. 115 10 46,5 5 23,25	323,045
	1813	Neg.	146·10 69·48 143·70 74·48	107·790 106·590 109·090	107·190 107·840	107·515	at div. 105 11 7 57 13 10 18 53	at div. 110 11 7 43,5 13 24 18 38	by div. 105 10 56,0 5 28,00	by div. 110 10 54,5 5 27,25	327,623
	1814	Pos.	74·48 157·88 80·64 154·18	116·180 119·260 117·410	117·720 118·335	118·027	at div. 115 11 24 10 29 52,5 35 6	at div. 120 11 24 22 29 39 35 20	by div. 115 10 56,0 5 28,0	by div. 120 10 58,0 5 29,0	328,605
T=44·05 B=29·660	1815	Neg.	154·18 69·50 148·90 75·02	111·840 109·200 111·960	110·520 110·580	110·550	at div. 110 11 40 50,5 46 22 51 58	at div. 115 11 40 38 46 35,5 51 43,5	by div. 110 11 7,5 5 33,75	by div. 115 11 5,5 5 32,75	333,640
March 1 T=46·80 B=29·240	1816	Pos.	93·88 140·60 97·40 138·30	117·240 119·000 117·850	118·120 118·425	118·272	at div. 115 10 6 56 12 53 17 46,5	at div. 120 10 7 19 12 29 18 12,5	by div. 115 10 50,5 5 25,25	by div. 120 10 53,5 5 26,75	326,232
	1817	Neg.	138·30 84·00 135·32 87·80	111·150 109·660 111·560	110·405 110·610	110·507	at div. 110 10 23 38 29 2,5 34 36	at div. 115 10 23 19 29 23 34 14	by div. 110 10 58,0 5 29,0	by div. 115 10 55,0 5 27,5	328,848
	1818	Pos.	87·80 149·26 92·34 146·00	118·530 120·800 119·170	119·665 119·985	119·825	at div. 115 10 39 50 45 51 50 41	at div. 120 10 40 7,5 45 32,5 51 1	by div. 115 10 51,0 5 25,50	by div. 120 10 53,5 5 26,75	326,706
Continued.	1819	Neg.	146·00 79·68 142·00 84·18	112·840 110·840 113·090	111·840 111·965	111·902	at div. 110 10 56 39 11 1 56 7 38	at div. 115 10 56 23,5 11 2 13 7 20	by div. 110 10 59,0 5 29,50	by div. 115 10 56,5 5 28,25	329,025

49th Series continued.—2-inch *Zinc* balls, with *single* copper wire; diameter = ·0178 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1820	Pos.	84·18 154·86 89·48 150·72	119·520 122·170 120·100	120·845 121·135	120·990	at div. 120 11 13 3,5 18 37 23 59	at div. 125 11 13 18,5 18 21 24 16	by div. 120 10 55,5 5 27,75	by div. 125 10 57,5 5 28,75	327,948
T=47·30 B=29·498	1821	Neg.	150·72 77·20 145·90 82·00	113·960 111·550 113·950	112·755 112·750	112·752	at div. 110 11 29 42,5 34 55 40 40,5	at div. 115 11 29 28 35 10 40 24	by div. 110 10 58,0 5 29,0	by div. 115 10 56,0 5 28,0	328,450
March 2 T=46·97 B=29·760	1822	Pos.	93·36 135·60 95·38 133·90	114·480 115·490 114·640	114·985 115·065	115·025	at div. 115 9 47 51,5 52 58 58 4,5	at div. 120 9 48 15 52 33,5 58 30	by div. 115 10 13,0 5 6,5	by div. 120 10 15,0 5 7,5	306,505
	1823	Neg.	133·90 82·00 131·30 84·18	107·950 106·650 107·740	107·300 107·195	107·247	at div. 105 10 3 25 8 14 13 39	at div. 110 10 3 6 8 34 13 18	by div. 105 10 14,0 5 7,0	by div. 110 10 12,0 5 6,0	306,551
	1824	Pos.	84·18 143·74 86·80 140·08	113·960 115·270 113·440	114·615 114·355	114·485	at div. 110 10 18 27 24 3,5 28 38,5	at div. 115 10 18 43,5 23 46,5 28 56,5	by div. 110 10 11,5 5 5,75	by div. 115 10 13,0 5 6,50	306,423
	1825	Neg.	140·08 74·46 137·64 77·32	107·270 106·050 107·480	106·660 106·765	106·712	at div. 105 10 34 9,5 39 5 44 22	at div. 110 10 33 55 39 20,5 44 6	by div. 105 10 12,5 5 6,25	by div. 110 10 11,0 5 5,50	305,993
	1826	Pos.	77·32 149·50 80·70 146·40	113·410 115·100 113·550	114·255 114·325	114·290	at div. 110 10 49 15 54 43,5 59 25	at div. 115 10 49 28,5 54 29,5 59 39,5	by div. 110 10 10,0 5 5,0	by div. 115 10 11,0 5 5,5	305,429
T=46·95 B=29·680	1827	Neg.	146·40 69·00 142·70 72·40	107·700 105·850 107·550	106·775 106·700	106·737	at div. 105 11 4 50,5 9 47,5 15 1,5	at div. 110 11 4 38 10 1 14 48	by div. 105 10 11,0 5 5,5	by div. 110 10 10,0 5 5,0	305,326
			During the whole of this morning the wind was very boisterous, yet I have seldom met with more accordant experiments.								

50th Series.—2-inch *Ivory* balls, with *single* copper wire; diameter = ·0178 inch.

March 3 T=49·60 B=29·920	1828	Pos.	96·90 107·20 98·12 106·28	102·050 102·660 102·200	102·355 102·430	102·392	at div. 102 9 48 18 51 25,5 54 13	at div. 104 9 48 41,5 51 1 54 42	by div. 102 5 55,0 2 57,50	by div. 104 6 0,5 3 0,25	178,039
Continued.	1829	Neg.	106·28 94·46 105·10 95·72	100·370 99·780 100·410	100·075 100·095	100·085	at div. 100 9 57 22 10 0 19,5 3 20,5	at div. 102 9 57 2,5 10 0 42 2 56	by div. 100 5 58,5 2 59,25	by div. 102 5 53,5 2 56,75	179,144

50th SERIES continued.—2-inch *Ivory* balls, with *single* copper wire; diameter = ·0178 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1830	Pos.	95·72 108·72 97·22 107·60	102·220 102·970 102·410	102·595 102·690	102·642	at div. 102 10 6 19,5 9 29,5 12 14	at div. 104 10 6 37 9 9 12 36	by div. 102 5 54,5 2 57,25	by div. 104 5 59,0 2 59,50	s 177,972
	1831	Neg.	107·60 93·88 106·30 95·28	100·740 100·090 100·790	100·415 100·440	100·427	at div. 100 10 15 28 18 20 21 26	at div. 102 10 15 11,5 18 38,5 21 5,5	by div. 100 5 58,0 2 59,0	by div. 102 5 54,0 2 57,0	178,573
	1832	Pos.	95·28 109·76 96·98 108·50	102·520 103·370 102·740	102·945 103·055	103·000	at div. 102 10 24 19 27 33 30 12	at div. 104 10 24 35 27 15 30 32	by div. 102 5 53,0 2 56,5	by div. 104 5 57,0 2 58,5	177,500
	1833	Neg.	108·50 93·70 107·00 95·20	101·100 100·350 101·100	100·725 100·725	100·725	at div. 100 10 33 29,5 36 17 39 29	at div. 102 10 33 14 36 34,5 39 9,5	by div. 100 5 59,5 2 59,75	by div. 102 5 55,5 2 57,75	179,025
	1834	Pos.	95·20 110·48 97·00 109·00	102·840 103·740 103·000	103·290 103·370	103·330	at div. 102 10 42 16 45 36 48 10,5	at div. 104 10 42 31 45 18,5 48 29,5	by div. 102 5 54,5 2 57,25	by div. 104 5 58,5 2 59,25	178,580
T = 50·03 B = 29·936	1835	Neg.	109·00 93·90 107·30 95·56	101·450 100·600 101·430	101·025 101·015	101·020	at div. 100 10 51 35 54 19 57 38	at div. 102 10 51 19,5 54 36 57 18	by div. 100 6 3,0 3 1,50	by div. 102 5 58,5 2 59,25	180,353
March 4 T = 51·51 B = 29·524	1836	Pos.	96·30 107·60 97·30 106·70	101·950 102·450 102·000	102·200 102·225	102·212	at div. 102 9 45 26,5 48 18,5 51 2	at div. 104 9 45 46 47 56,5 51 25	by div. 102 5 35,5 2 47,75	by div. 104 5 39,0 2 49,50	167,935
	1837	Neg.	106·70 93·90 105·48 94·80	100·300 99·690 100·140	99·995 99·915	99·955	at div. 98 9 54 13,5 56 26 59 50,5	at div. 100 9 53 57 56 45 59 30	by div. 98 5 37,0 2 48,5	by div. 100 5 33,0 2 46,5	166,545
	1838	Pos.	94·80 108·48 95·84 107·34	101·640 102·160 101·590	101·900 101·875	101·887	at div. 100 10 2 9 5 28 7 42	at div. 102 10 2 25 5 11 8 1	by div. 100 5 33,0 2 46,5	by div. 102 5 36,0 2 48,0	167,915
	1839	Neg.	107·34 92·60 105·94 93·52	99·970 99·270 99·730	99·620 99·500	99·560	at div. 98 10 11 3 13 26 16 39	at div. 100 10 10 48 13 42 16 21	by div. 98 5 36,0 2 48,0	by div. 100 5 33,0 2 46,5	166,830
	1840	Pos.	93·52 108·82 94·76 107·56	101·170 101·790 101·160	101·480 101·475	101·477	at div. 100 10 19 6,5 22 17 24 41	at div. 102 10 19 21 22 1 24 58	by div. 100 5 34,5 2 47,25	by div. 102 5 37,0 2 48,50	168,173
T = 51·50 B = 29·524	1841	Neg.	107·56 91·68 106·02 92·70	99·620 98·850 99·360	99·235 99·105	99·170	at div. 98 10 27 53 30 24 33 29	at div. 100 10 27 39,5 30 39 33 12,5	by div. 98 5 36,0 2 48,0	by div. 100 5 33,0 2 46,5	167,123

50th SERIES continued.—2-inch *Ivory* balls, with *single* copper wire; diameter = ·0178 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
March 5 T = 50·25 B = 30·072	1842	Pos.	94·00 109·30 95·40 107·72	101·650 102·350 101·560	102·000 101·955	101·977	at div. 100 10 21 10 24 30 26 51	at div. 102 10 21 26 24 16 27 8	by div. 100 5 41,0 2 50,5	by div. 102 5 42,0 2 51,0	• 170,994
	1843	Neg.	107·72 90·90 107·40 91·10	99·310 99·150 99·250	99·230 99·200	99·215	at div. 98 10 30 7 32 41 35 43,5	at div. 100 10 29 53 32 53 35 29	by div. 98 5 36,5 2 48,25	by div. 100 5 36,0 2 48,00	168,098
	1844	Pos.	91·10 109·90 92·40 108·12	100·500 101·150 100·260	100·825 100·705	100·765	at div. 100 10 38 27 41 25 44 5	at div. 102 10 38 38 41 12 44 18	by div. 100 5 38,0 2 49,0	by div. 102 5 40,0 2 50,0	169,382
	1845	Neg.	108·12 89·40 106·12 90·70	98·760 97·760 98·410	98·260 98·085	98·172	at div. 98 10 47 2 49 48 52 38	at div. 100 10 46 50,5 50 1 52 24	by div. 98 5 36,0 2 48,00	by div. 100 5 33,5 2 46,75	167,893
	1846	Pos.	90·70 108·62 92·02 107·00	99·660 100·320 99·510	99·990 99·915	99·952	at div. 98 10 55 18 58 33 11 0 55,5	at div. 100 10 55 30 58 19 11 1 10	by div. 98 5 37,5 2 48,75	by div. 100 5 40,0 2 50,00	169,970
T = 50·21 B = 30·082	1847	Neg.	107·00 88·68 105·34 89·52	97·840 97·010 97·430	97·425 97·220	97·322	at div. 96 11 4 10,5 6 42 9 47,5	at div. 98 11 3 58,5 6 55 9 34	by div. 96 5 37,0 2 48,50	by div. 98 5 35,5 2 47,75	168,005
	1848 1849		} These stated	two ex in the	periments note in	are trans page 77.	posed to page	clxiv, the rea	son is		

51st SERIES.—2¼-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

March 11 T = 46·07 B = 30·040	1850	Pos.	88·30 125·36 88·90 124·12	106·830 107·130 106·510	106·980 106·820	106·900	at div. 105 9 58 13 10 4 20,5 9 42	at div. 110 9 58 43 10 3 50 10 13,5	by div. 105 11 29,0 5 44,50	by div. 110 11 30,5 5 45,25	344,785
	1851	Neg.	124·12 69·80 122·30 70·60	96·960 96·050 96·450	96·505 96·250	96·377	at div. 95 10 15 50 21 21 27 15,5	at div. 100 10 15 29,5 21 42,5 26 54	by div. 95 11 25,5 5 42,75	by div. 100 11 24,5 5 42,25	342,612
	1852	Pos.	70·60 139·52 72·00 137·20	105·060 105·760 104·600	105·410 105·180	105·295	at div. 105 10 33 0,5 38 48 44 32	at div. 110 10 33 16,5 38 32 44 49	by div. 105 11 31,5 5 45,75	by div. 110 11 32,5 5 46,25	345,779
Continued.	1853	Neg.	137·20 53·80 134·60 55·70	95·500 94·200 95·150	94·850 94·675	94·762	at div. 90 10 50 35 55 54 11 2 5	at div. 95 10 50 21,5 56 7,5 11 1 51	by div. 90 11 30,0 5 45,00	by div. 95 11 29,5 5 44,75	344,762

51st SERIES continued.—2¼-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1854	Pos.	55·70 152·02 58·00 150·10	103·860 105·010 104·050	104·435 104·530	104·482	at div. 100 11 7 31,5 13 37 19 0	at div. 105 11 7 43 13 25,5 19 12	by div. 100 11 28,5 5 44,25	by div. 105 11 29,0 5 44,50	• 344,474
	1855	Neg.	150·10 40·12 148·04 42·10	95·110 94·080 95·070	94·595 94·575	94·585	at div. 90 11 25 8 30 35 36 40,5	at div. 95 11 24 58 30 45 36 30	by div. 90 11 32,5 5 46,25	by div. 95 11 32,0 5 46,00	346,021
	1856	Pos.	42·10 165·80 45·00 162·92	103·950 105·400 103·960	104·675 104·680	104·677	at div. 100 11 42 12,5 49 18 53 49	at div. 105 11 42 21,5 49 9 53 58,5	by div. 100 11 36,5 5 48,25	by div. 105 11 37,0 5 48,50	348,483
T = 46·38 B = 30·000	1857	Neg.	162·92 27·90 159·14 31·00	95·410 93·520 95·070	94·465 94·295	94·380	at div. 90 11 59 57,5 0 5 32 11 37,5	at div. 95 11 59 49,5 0 5 40,5 11 29	by div. 90 11 40,0 5 50,00	by div. 95 11 39,5 5 49,75	349,781
March 12 T = 48·18 B = 30·088	1858	Pos.	88·22 120·52 88·70 119·12	104·370 104·610 103·910	104·490 104·260	104·375	at div. 100 10 1 42 8 31 13 16	at div. 105 10 2 16 7 56 13 52	by div. 100 11 34,0 5 47,0	by div. 105 11 36,0 5 48,0	347,875
	1859	Neg.	119·12 69·12 117·10 69·60	94·120 93·110 93·350	93·615 93·230	93·422	at div. 90 10 19 55 25 8 31 24	at div. 95 10 19 33 25 31 31 1	by div. 90 11 29,0 5 44,5	by div. 95 11 28,0 5 44,0	344,158
	1860	Pos.	69·60 134·88 71·00 132·58	102·240 102·940 101·790	102·590 102·365	102·477	at div. 100 10 36 52 42 57 48 27	at div. 105 10 37 9 42 40 48 45	by div. 100 11 35,0 5 47,5	by div. 105 11 36,0 5 48,0	347,748
	1861	Neg.	132·58 52·70 130·70 54·00	92·640 91·700 92·350	92·170 92·025	92·097	at div. 90 10 54 30,5 11 0 35 5 59,5	at div. 95 10 54 16,5 11 0 17,5 5 45	by div. 90 11 29,0 5 44,50	by div. 95 11 28,5 5 44,25	344,395
	1862	Pos.	54·00 148·22 55·70 146·32	101·110 101·960 101·010	101·535 101·485	101·510	at div. 100 11 11 37 17 30 23 8,5	at div. 105 11 11 49 17 18 23 21	by div. 100 11 31,5 5 45,75	by div. 105 11 32,0 5 46,00	345,825
	1863	Neg.	146·32 37·80 143·90 40·72	92·060 90·850 92·310	91·455 91·580	91·517	at div. 90 11 29 6,5 34 49 40 47	at div. 95 11 28 56,5 34 59,5 40 36,5	by div. 90 11 40,5 5 50,25	by div. 95 11 40,0 5 50,00	350,174
	1864	Pos.	40·72 161·28 44·28 158·00	101·000 102·780 102·140	101·890 102·460	102·175	at div. 100 11 46 35 52 35 58 19,5	at div. 105 11 46 44,5 52 25,5 58 29,5	by div. 100 11 44,5 5 52,25	by div. 105 11 45,0 5 52,50	352,359
T = 48·45 B = 30·096	1865	Neg.	158·00 26·80 154·20 29·80	92·400 90·500 92·000	91·450 91·250	91·350	at div. 90 0 4 21,5 10 8 16 6	at div. 95 0 4 13 10 17 15 57	by div. 90 11 44,5 5 52,25	by div. 95 11 44,0 5 52,00	352,183

51st SERIES continued.—2½-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
March 13 T = 49·51 B = 29·960	1866	Pos.	99·12 132·88 99·80 130·46	116·000 116·340 115·130	116·170 115·735	115·952	at div. 115 9 49 32 55 35 10 1 12	at div. 120 9 50 5 55 1 11 1 48	by div. 115 11 40,0 5 50,0	by div. 120 11 43,0 5 51,5	350,286
	1867	Neg.	130·46 80·60 128·92 81·10	105·530 104·760 105·010	105·145 104·885	105·015	at div. 105 10 7 10,5 12 58 18 46,5	at div. 110 10 6 48 13 21 18 23	by div. 105 11 36,0 5 48,0	by div. 110 11 35,0 5 47,5	347,999
	1868	Pos.	81·10 147·56 82·20 146·26	114·330 114·880 114·230	114·605 114·555	114·580	at div. 110 10 24 25 30 46 36 5	at div. 115 10 24 41,5 30 29 36 22	by div. 110 11 40,0 5 50,00	by div. 115 11 40,5 5 50,25	350,229
	1869	Neg.	146·26 63·40 144·00 64·52	104·830 103·700 104·260	104·265 103·980	104·122	at div. 100 10 42 27 47 55 54 8	at div. 105 10 42 13,5 48 9 53 54	by div. 100 11 41,0 5 50,50	by div. 105 11 40,5 5 50,25	350,294
	1870	Pos.	64·52 162·30 67·40 160·26	113·410 114·850 113·830	114·130 114·340	114·235	at div. 110 10 59 45 11 5 57 11 30	at div. 115 10 59 56,5 11 5 45 11 42	by div. 110 11 45,0 5 51,50	by div. 115 11 45,5 5 52,75	352,712
	1871	Neg.	160·26 49·70 156·90 52·88	104·980 103·300 104·890	104·140 104·095	104·117	at div. 100 11 17 46 23 24 29 36	at div. 105 11 17 36 23 34,5 29 25	by div. 100 11 50,0 5 55,0	by div. 105 11 49,0 5 54,5	354,588
	1872	Pos.	52·88 174·10 56·50 170·32	113·490 115·300 113·410	114·395 114·355	114·375	at div. 110 11 35 17 41 28 47 5,5	at div. 115 11 35 26,5 41 18 47 15,5	by div. 110 11 48,5 5 54,25	by div. 115 11 49,0 5 54,50	354,469
T = 49·78 B = 30·050	1873	Neg.	170·32 38·80 165·90 42·00	104·560 102·350 103·950	103·455 103·150	103·302	at div. 100 11 53 18,5 59 1,5 0 5 7,5	at div. 105 11 53 9,5 59 10,5 0 4 58	by div. 100 11 49,0 5 54,50	by div. 105 11 48,5 5 54,25	354,335
March 14 T = 49·80 B = 30·284	1874	Pos.	60·32 138·80 62·30 136·80	99·560 100·550 99·550	100·055 100·050	100·052	at div. 100 9 48 38 54 24,5 10 0 9	at div. 105 9 48 52 54 10 10 0 23,5	by div. 100 11 31,0 5 45,50	by div. 105 11 31,5 5 45,75	345,502
	1875	Neg.	136·80 44·20 133·98 46·40	90·500 89·090 90·190	89·795 89·640	89·717	at div. 85 10 6 9 12 31 17 39,5	at div. 90 10 5 57 12 43 17 27	by div. 85 11 30,5 5 45,25	by div. 90 11 30,0 5 45,00	345,014
	1876	Pos.	46·40 151·00 49·10 148·20	98·700 100·050 98·650	99·375 99·350	99·362	at div. 95 10 23 7,5 29 13 34 39	at div. 100 10 23 18 29 2 34 50	by div. 95 11 31,5 5 45,75	by div. 100 11 32,0 5 46,00	345,968
Continued.	1877	Neg.	148·20 31·90 144·80 34·40	90·050 88·350 89·600	89·200 88·975	89·087	at div. 85 10 40 45,5 46 15 52 16,5	at div. 90 10 40 36 46 24,5 52 6,5	by div. 85 11 31,0 5 45,50	by div. 90 11 30,5 5 45,25	345,296

51st SERIES continued.—2½-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1878	Pos.	34·40 161·94 37·32 159·72	98·170 99·630 98·520	98·900 99·075	98·987	at div. 95 10 57 51 11 3 53 9 25	at div. 100 10 57 59,5 11 3 44 9 34	by div. 95 11 34,0 5 47,00	by div. 100 11 34,5 5 47,25	347,199
T=49·91 B=30·300	1879	Neg.	159·72 19·70 156·80 22·10	89·710 88·250 89·450	88·980 88·850	88·915	at div. 85 11 15 28 21 4 27 6	at div. 90 11 15 20 21 12,5 26 57,5	by div. 85 11 38,0 5 49,00	by div. 90 11 37,5 5 48,75	348,804

52nd SERIES.—2½-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

March 7 T=47·11 B=29·750	1848	Pos.	79·12 147·32 81·40 145·70	113·220 114·360 113·550	113·790 113·955	113·872	at div. 110 9 45 19,5 54 51,5 10 3 4	at div. 115 9 45 44,5 54 25,5 10 3 30	by div. 110 17 44,5 8 52,25	by div. 115 17 45,5 8 52,75	532,637
	1849	Neg.	145·70 37·70 143·32 39·82	91·700 90·510 91·570	91·105 91·040	91·072	at div. 90 10 12 27,5 21 6,5 30 5,5	at div. 95 10 12 11,5 21 23 29 49	by div. 90 17 38,0 8 49,00	by div. 95 17 37,5 8 48,75	528,946
			The night of March 9 was *very* boisterous, and the wind continued exceedingly high and violent during the whole of the following forenoon. I had no opportunity of making any experiments; but I watched the torsion rod, and occasionally observed a *very slight vertical* motion, which however would not have affected the results, if any experiments had been made. I could not discover any *lateral* disturbance.								
March 16 T=52·67 B=30·350	1880	Neg.	128·00 58·90 126·80 62·70	93·450 92·850 94·750	93·150 93·800	93·475	at div. 90 10 35 51 44 54 55 14	at div. 95 10 35 24 45 21 54 45	by div. 90 19 23,0 9 41,5	by div. 95 19 21,0 9 40,5	580,805
	1881	Pos.	62·70 179·30 69·12 176·30	121·000 124·210 122·710	122·605 123·460	123·032	at div. 120 11 4 34 14 22 23 34,5	at div. 125 11 4 49,5 14 5,5 23 51,5	by div. 120 19 0,5 9 30,25	by div. 125 19 2,0 9 31,00	570,705
T=53·05 B=30·332	1882	Neg.	176·30 32·50 160·20 38·80	104·400 96·350 99·500	100·375 97·925	99·150	at div. 95 11 34 8,5 43 28 53 16	at div. 100 11 33 54,5 43 42 53 1	by div. 95 19 7,5 9 33,75	by div. 100 19 6,5 9 33,25	573,335
March 17 T=53·03 B=30·180			Before I moved the masses I let them remain two minutes at the end of each of the three following experiments, in order to shorten the arc of vibration, and thus prevent the balls from striking against the sides of the torsion box.								
	1883	Neg.	104·00 89·40 103·80 90·00	96·700 96·600 96·900	96·650 96·750	96·700	at div. 96 9 51 18 10 0 54 9 39	at div. 98 9 50 30 10 0 44 8 49	by div. 96 18 21,0 9 10,5	by div. 98 18 19,0 9 9,5	550,150
Continued.	1884	Pos.	90·00 153·10 96·90 154·00	121·550 125·000 125·450	123·275 125·225	124·250	at div. 120 10 20 14 30 23 38 34	at div. 125 10 20 43,5 29 51 39 5,5	by div. 120 18 20,0 9 10,0	by div. 125 18 22,0 9 11,0	550,850

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=53·21 B=30·166	1885	Neg.	154·00 54·00 149·40 59·84	104·000 101·700 104·620	102·850 103·160	103·005	at div. 100 10 49 48,5 58 56 11 8 42,5	at div. 105 10 49 30 59 14,5 11 8 22,5	by div. 100 18 54,0 9 27,00	by div. 105 18 52,5 9 26,25	* 566,549
March 18 T=53·00 B=29·790	1886	Pos.	99·00 111·70 99·00 112·02	105·350 105·350 105·510	105·350 105·430	105·390	at div. 105 9 58 3 10 7 21 15 56	at div. 106 9 58 30 10 6 54 16 23	by div. 105 17 53,0 8 56,5	by div. 106 17 53,0 8 56,5	536,500
	1887	Neg.	112·02 51·90 109·34 53·52	81·960 80·620 81·430	81·290 81·025	81·157	at div. 80 10 26 10 34 55 44 9	at div. 85 10 25 41 35 25 43 38	by div. 80 17 59,0 8 59,5	by div. 85 17 57,0 8 58,5	539,269
T=53·05 B=29·782	1888	Pos.	53·52 154·12 56·00 148·70	103·820 105·060 102·350	104·440 103·705	104·072	at div. 100 10 53 9 11 2 42 11 17	at div. 105 10 53 26 11 2 24 11 35,5	by div. 100 18 8,0 9 4,00	by div. 105 18 9,5 9 4,75	544,611
March 19 T=50·18 B=29·550	1889	Pos.	116·70 138·88 117·80 138·48	127·790 128·340 128·140	128·065 128·290	128·177	at div. 128 10 5 7,5 13 56 22 39,5	at div. 129 10 5 23 13 40 22 56	by div. 128 17 32,0 8 46,0	by div. 129 17 33,0 8 46,5	526,088
	1890	Neg.	138·48 73·00 135·40 75·00	105·740 104·200 105·200	104·970 104·700	104·835	at div. 100 10 32 34 40 33,5 50 16,5	at div. 105 10 32 7,5 41 0,5 49 48	by div. 100 17 42,5 8 51,25	by div. 105 17 40,5 8 50,25	530,283
	1891	Pos.	75·00 177·30 79·84 173·50	126·150 128·570 126·670	127·360 127·620	127·490	at div. 125 10 59 1 11 8 8,5 16 43	at div. 130 10 59 18 11 7 51,5 17 1	by div. 125 17 42,0 8 51,0	by div. 130 17 43,0 8 51,5	531,249
T=50·15 B=29·516	1892	Neg.	173·50 39·76 168·50 44·90	106·630 104·130 106·700	105·380 105·415	105·397	at div. 105 11 26 2 34 52 43 44	at div. 110 11 25 49 35 5 43 30	by div. 105 17 42,0 8 51,0	by div. 110 17 41,0 8 50,5	530,960
			During the whole of the time of these 4 experiments the wind was very *gusty*, and blew violently against the house at intervals; which caused a *slight dancing* motion in the torsion rod, never before witnessed during any experiment.								
March 20 T=48·61 B=29·326			The masses had remained on the positive side since the preceding experiments, and this morning the position of the torsion rod was taken from its *spontaneous* oscillation without disturbing the masses.								
	1893	Pos.	177·26 120·58 117·52 120·32	118·920 119·050 118·920	118·985 118·985	118·985	at div. 118 9 46 26 59 22 10 4 12	at div. 119 9 48 16 57 17 10 6 22	by div. 118 17 46,0 8 53,0	by div. 119 18 6,0 9 3,0	542,850
Continued.	1894	Neg.	120·32 68·60 117·30 69·28	94·460 92·950 93·290	93·705 93·120	93·412	at div. 90 10 16 39,5 24 49 34 38	at div. 95 10 16 5,5 25 25 34 1,5	by div. 90 17 58,5 8 59,25	by div. 95 17 56,0 8 58,00	538,397

52nd SERIES continued.—2½-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1895	Pos.	158·40 28·12 152·70 31·80	115·810 117·630 115·660	116·720 116·645	116·682	at div. 115 10 43 41,5 53 0,5 11 1 53	at div. 120 10 44 0,5 52 41 11 2 13,5	by div. 115 18 11,5 9 5,75	by div. 120 18 13,0 9 6,50	• 546,002
T=48·61 B=29·390	1896	Neg.	69·28 162·34 72·92 158·40	93·260 90·410 92·250	91·835 91·330	91·582	at div. 90 11 11 21 20 9,5 29 16	at div. 95 11 11 8 20 23 29 2	by div. 90 17 55,0 8 57,5	by div. 95 17 54,0 8 57,0	537,342
March 21 T=46·83 B=29·928			Although morning, state of	the wind yet (con complete	had been trary to repose	very high what took when I	during the place yesterday commenced the	night, and was morning) the experiments.	very bois torsion rod	terous this was in a	
	1897	Pos.	113·80 127·36 114·00 126·60	120·580 120·680 120·300	120·630 120·490	120·560	at div. 120 9 49 44 59 18 10 7 55	at div. 121 9 50 10 58 52 10 8 23	by div. 120 18 11,0 9 5,5	by div. 121 18 13,0 9 6,5	546,060
	1898	Neg.	126·60 68·88 125·40 71·50	97·740 97·140 98·450	97·440 97·795	97·617	at div. 95 10 17 52 26 9 35 29,5	at div. 100 10 17 22,5 26 39 34 58,5	by div. 95 17 37,5 8 48,75	by div. 100 17 36,0 8 48,00	528,357
	1899	Pos.	71·50 168·30 75·90 165·00	119·900 122·100 120·450	121·000 121·275	121·137	at div. 120 10 44 22,5 53 19 11 1 59,5	at div. 125 10 44 40 53 1 11 2 18,5	by div. 120 17 37,0 8 48,50	by div. 125 17 38,5 8 49,25	528,671
T=46·87 B=29·960	1900	Neg.	165·00 32·80 158·50 34·72	98·900 95·650 96·610	97·275 96·130	96·702	at div. 95 11 11 16,5 20 1 28 59,5	at div. 100 11 11 3,5 20 14,5 28 46	by div. 95 17 43,0 8 51,50	by div. 100 17 42,5 8 51,25	530,415
March 22 T=45·60 B=30·140	1901	Pos.	113·32 118·38 113·12 118·00	115·850 115·750 115·560	115·800 115·655	115·727	at div. 115 9 52 51 10 3 37 11 16	at div. 116 9 53 58 10 2 30 12 28	by div. 115 18 25,0 9 12,5	by div. 116 18 30,0 9 15,0	554,317
	1902	Neg.	118·00 68·40 117·60 69·40	93·200 93·000 93·500	93·100 93·250	93·175	at div. 90 10 22 5 30 7 39 42	at div. 95 10 21 31,5 30 42 39 7	by div. 90 17 37,0 8 48,50	by div. 95 17 35,5 8 47,75	528,024
	1903	Pos.	69·40 160·28 72·60 156·16	114·840 116·440 114·380	115·640 115·410	115·525	at div. 115 10 48 33 57 27 11 6 14	at div. 120 10 48 52 57 8,5 11 6 34	by div. 115 17 41,0 8 50,5	by div. 120 17 42,0 8 51,0	530,552
T=45·65 B=30·200	1904	Neg.	156·16 27·70 149·00 29·00	91·930 88·350 89·000	90·140 88·675	89·407	at div. 85 11 15 31 23 57 33 11	at div. 90 11 15 18 24 11 32 57	by div. 85 17 40,0 8 50,0	by div. 90 17 39,0 8 49,5	529,549
			The next mention	series, ed in the	with the note in	Ivory page 20.	balls, was made	with the *light*	torsion rod,		

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
March 23 T=44·85 B=30·136			The mass morning masses wards	es had the tor were put still	remained sion rod in motion, more.	in their was near it decrea	positive posi ly stationary at sed considera	tion during the 107 divisions: bly in the first	night, and but as soon experiment,	in the as the and after-	s
	1905	Pos.	95·52 115·00 95·56 110·60	105·260 105·280 103·080	105·270 104·180	104·725	at div. 104 2 12 59,5 16 35,5 19 52,5	at div. 106 2 13 12 16 22 20 8	by div. 104 6 53,0 3 26,5	by div. 106 6 56,0 3 28,0	207,043
	1906	Neg.	110·60 89·18 107·00 89·28	99·890 98·090 98·140	98·990 98·115	98·552	at div. 98 2 23 18 26 23 29 37	at div. 100 2 23 6 26 36 29 23	by div. 98 6 19,0 3 9,5	by div. 100 6 17,0 3 8,5	189,224
	1907	Pos.	89·28 111·00 90·70 109·32	100·140 100·850 100·010	100·495 100·430	100·462	at div. 100 2 32 55 36 15,5 39 25	at div. 102 2 33 7 36 3 39 39	by div. 100 6 30,0 3 15,0	by div. 102 6 32,0 3 16,0	195,231
	1908	Neg.	109·32 85·70 107·20 87·00	97·510 96·450 97·100	96·980 96·775	96·877	at div. 96 2 42 52 45 56,5 49 22	at div. 98 2 42 41,5 46 8 49 9,5	by div. 96 6 30,0 3 15,0	by div. 98 6 28,0 3 14,0	194,562
	1909	Pos.	87·00 111·40 88·80 110·00	99·200 100·100 99·400	99·650 99·750	99·700	at div. 98 2 52 28,5 56 3 59 0	at div. 100 2 52 39 55 52 59 12	by div. 98 6 31,5 3 15,75	by div. 100 6 33,0 3 16,50	196,387
	1910	Neg.	110·00 84·58 108·60 87·00	97·290 96·590 97·800	96·940 97·195	97·067	at div. 96 3 2 33,5 5 42 9 13	at div. 98 3 2 24 5 53 9 2	by div. 96 6 39,5 3 19,75	by div. 98 6 38,0 3 19,00	199,350
	1911	Pos.	87·00 113·36 89·72 111·52	100·180 101·540 100·620	100·860 101·080	100·970	at div. 100 3 12 24 15 53 19 0	at div. 102 3 12 33,5 15 42 19 12	by div. 100 6 36,0 3 18,00	by div. 102 6 38,5 3 19,25	198,606
T=45·17 B=30·126	1912	Neg.	111·52 86·30 109·88 88·50	98·910 98·090 99·190	98·500 98·640	98·570	at div. 98 3 22 32 25 47 29 13,5	at div. 100 3 22 22,5 25 57,5 29 1,5	by div. 98 6 41,5 3 20,75	by div. 100 6 39,0 3 19,50	200,394
March 24 T=43·28 B=30·236	1913	Pos.	89·46 104·40 91·40 103·80	96·930 97·900 97·600	97·415 97·750	97·582	at div. 96 10 1 5 4 44 7 23	at div. 98 10 1 22,5 4 25,5 7 43	by div. 96 6 18,0 3 9,00	by div. 98 6 20,5 3 10,25	189,988
	1914	Neg.	103·80 87·04 102·08 88·80	95·420 94·560 95·440	94·990 95·000	94·995	at div. 94 10 11 6 14 4 17 33	at div. 96 10 10 51 14 20 17 14,5	by div. 94 6 27,0 3 13,50	by div. 96 6 23,5 3 11,75	192,630
Continued.	1915	Pos.	88·80 106·80 90·28 105·80	97·800 98·540 98·040	98·170 98·290	98·230	at div. 98 10 20 37 23 52 26 59,5	at div. 100 10 20 51 23 37 27 15,5	by div. 98 6 22,5 3 11,25	by div. 100 6 24,5 3 12,25	191,365

53rd SERIES continued.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1916	Neg.	105·80 85·56 104·60 86·90	95·680 95·080 95·750	95·380 95·415	95·397	at div. 94 10 30 26 33 21 36 52	at div. 96 10 30 14 33 34 36 38	by div. 94 6 26,0 3 13,0	by div. 96 6 24,0 3 12,0	* 192,302
	1917	Pos.	86·90 109·16 88·52 107·90	98·020 98·840 98·210	98·435 98·525	98·480	at div. 98 10 39 56 43 12,5 46 18	at div. 100 10 40 7 43 1 46 30,5	by div. 98 6 22,0 3 11,00	by div. 100 6 23,5 3 11,75	191,180
	1918	Neg.	107·90 83·90 106·30 85·60	95·900 95·100 95·950	95·500 95·525	95·512	at div. 94 10 49 43,5 52 39,5 56 8	at div. 96 10 49 33,5 52 50 55 56	by div. 94 6 24,5 3 12,25	by div. 96 6 22,5 3 11,25	191,494
	1919	Pos.	85·60 110·74 87·50 109·32	98·170 99·120 98·410	98·645 98·765	98·705	at div. 98 10 59 10 11 2 28 5 30,5	at div. 100 10 59 20 11 2 17,5 5 42	by div. 98 6 20,5 3 10,25	by div. 100 6 22,0 3 11,00	190,514
	1920	Neg.	109·32 83·52 107·70 85·10	96·420 95·610 96·400	96·015 96·005	96·010	at div. 96 11 8 48,5 11 59 15 9,5	at div. 98 11 8 39 12 9 14 59	by div. 96 6 21,0 3 10,5	by div. 98 6 20,0 3 10,0	190,498
	1921	Pos.	85·10 111·92 87·40 110·80	98·510 99·660 99·100	99·085 99·380	99·232	at div. 98 11 18 17 21 37,5 24 33	at div. 100 11 18 26 21 27,5 24 43,5	by div. 98 6 16,0 3 8,00	by div. 100 6 17,5 3 8,75	188,462
	1922	Neg.	110·80 84·12 110·00 87·08	97·460 97·060 98·540	97·260 97·800	97·530	at div. 96 11 27 57 30 54,5 34 21,5	at div. 98 11 27 48 31 4 34 11	by div. 96 6 24,5 3 12,25	by div. 98 6 23,0 3 11,50	191,677
	1923	Pos.	87·08 115·02 89·90 114·58	101·050 102·460 102·240	101·755 102·350	102·052	at div. 102 11 37 25 40 34 43 40	at div. 104 11 37 34 40 24 43 50	by div. 102 6 15,0 3 7,5	by div. 104 6 16,0 3 8,0	187,513
T=43·61 B=30·230	1924	Neg.	114·58 87·48 113·32 90·50	101·030 100·400 101·910	100·715 101·155	100·935	at div. 100 11 46 58,5 50 2,5 53 23,5	at div. 102 11 46 49,5 50 12 53 13	by div. 100 6 25,0 3 12,50	by div. 102 6 23,5 3 11,75	192,150

54th SERIES.—2½-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

March 25 T=45·65 B=30·116	1925	Pos.	94·80 116·92 95·20 116·70	105·860 106·060 105·950	105·960 106·005	105·982	at div. 104 10 11 2 15 1,5 18 12	at div. 106 10 11 14,5 14 49 18 25	by div. 104 7 10,0 3 35,00	by div. 106 7 10,5 3 35,25	215,248
Continued.	1926	Neg.	116·70 88·00 116·14 88·34	102·350 102·070 102·240	102·210 102·155	102·182	at div. 102 10 22 4 25 38 29 14,5	at div. 104 10 21 54,5 25 48 29 4,5	by div. 102 7 10,5 3 35,25	by div. 104 7 10,0 3 35,00	215,227

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1927	Pos.	88·34 123·40 89·00 123·08	105·870 106·200 106·040	106·035 106·120	106·077	at div. 105 10 32 49,5 36 33,5 40 0,5	at div. 110 10 33 9 36 13 40 20,5	by div. 105 7 11,0 3 35,50	by div. 110 7 11,5 3 55,75	* 215,554
	1928	Neg.	123·08 82·10 122·68 82·80	102·590 102·390 102·740	102·490 102·565	102·527	at div. 100 10 45 51 47 10,5 51 4	at div. 105 10 43 34 47 28 50 46,5	by div. 100 7 13,0 3 56,50	by div. 105 7 12,5 3 56,25	216,574
	1929	Pos.	82·80 129·76 85·52 129·30	106·280 106·640 106·410	106·460 106·525	106·492	at div. 105 10 54 30,5 58 15 11 1 42,5	at div. 110 10 54 45 58 0,5 11 1 57,5	by div. 105 7 12,0 3 36,00	by div. 110 7 12,5 3 36,25	216,075
	1950	Neg.	129·30 76·70 128·72 77·40	103·000 102·710 103·060	102·855 102·885	102·870	at div. 100 11 5 32,5 8 54 12 46	at div. 105 11 5 19,5 9 7,5 12 32,5	by div. 100 7 13,5 3 56,75	by div. 105 7 13,0 5 36,50	216,607
	1931	Pos.	77·40 135·72 78·30 135·10	106·560 107·010 106·700	106·785 106·855	106·820	at div. 105 11 16 12,5 19 57 23 25	at div. 110 11 16 24 19 45,5 25 37	by div. 105 7 12,5 3 36,25	by div. 110 7 13,0 3 36,50	216,341
	1932	Neg.	135·10 71·70 134·40 72·76	103·400 103·050 103·580	103·225 103·315	103·270	at div. 100 11 27 14 30 37 34 28	at div. 105 11 27 5 30 48 34 16,5	by div. 100 7 14,0 3 37,00	by div. 105 7 13,5 3 36,75	216,857
	1933	Pos.	72·76 141·08 74·20 140·00	106·920 107·640 107·100	107·280 107·370	107·325	at div. 105 11 37 54,5 41 40,5 45 8	at div. 110 11 38 4,5 41 30 45 18,5	by div. 105 7 13,5 3 56,75	by div. 110 7 14,0 3 57,00	216,866
	1934	Neg.	140·00 67·80 138·86 69·10	103·900 103·330 103·980	103·615 103·655	103·635	at div. 100 11 48 58 52 21 56 12	at div. 105 11 48 48,5 52 30,5 56 2	by div. 100 7 14,0 3 37,00	by div. 105 7 13,5 3 56,75	216,819
	1935	Pos.	69·10 145·28 70·60 144·12	107·190 107·940 107·360	107·565 107·650	107·607	at div. 105 11 59 39 0 3 25 6 52,5	at div. 110 11 59 48 0 3 15,5 7 2	by div. 105 7 13,5 3 36,75	by div. 110 7 14,0 3 37,00	216,620
	1936	Neg.	144·12 64·20 142·88 65·20	104·160 103·540 104·040	103·850 103·790	103·820	at div. 100 0 10 42 14 5,5 18 56	at div. 105 0 10 35 14 14,5 17 47	by div. 100 7 14,0 3 37,0	by div. 105 7 14,0 3 37,0	217,000
T=46·30 B=30·050	1957	Pos.	65·20 149·50 66·90 148·02	107·250 108·100 107·460	107·675 107·780	107·727	at div. 105 0 21 22,5 25 8 28 36	at div. 110 0 21 31 24 59 28 44,5	by div. 105 7 13,5 3 36,75	by div. 110 7 13,5 3 36,75	216,750
March 26 T=47·67 B=29·656 Continued.	1958	Pos.	92·54 121·70 92·88 121·28	107·120 107·290 107·080	107·205 107·185	107·195	at div. 105 9 57 38,5 10 1 33 4 47	at div. 110 9 58 2 10 1 9,5 5 11,5	by div. 105 7 8,5 3 34,25	by div. 110 7 9,5 3 34,75	214,469

54th Series continued.—2½-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1939	Neg.	121·28 85·60 120·72 85·98	103·440 103·160 103·350	103·300 103·255	103·277	at div. 100 10 8 48 11 57 16 56,5	at div. 105 10 8 28,5 12 16 15 36,5	by div. 100 7 8,5 3 34,25	by div. 105 7 8,0 3 34,00	s 214,086
	1940	Pos.	85·98 127·60 86·70 127·00	106·790 107·150 106·850	106·970 107·000	106·985	at div. 105 10 19 16 23 3,5 26 24,5	at div. 110 10 19 32,5 22 47 26 41,5	by div. 105 7 8,5 3 34,25	by div. 110 7 9,0 3 34,50	214,349
	1941	Neg.	127·00 79·72 126·38 80·32	103·360 103·050 103·350	103·205 103·200	103·202	at div. 100 10 30 18 33 34 37 27	at div. 105 10 30 3,5 33 48,5 37 12	by div. 100 7 9,0 3 34,50	by div. 105 7 8,5 3 34,25	214,340
	1942	Pos.	80·32 133·38 81·00 132·90	106·850 107·190 106·950	107·020 107·070	107·045	at div. 105 10 40 49 44 34 47 57	at div. 110 10 41 2 44 20,5 48 10,5	by div. 105 7 8,0 3 34,00	by div. 110 7 8,5 3 34,25	214,102
	1943	Neg.	132·90 74·22 132·34 74·84	103·560 103·280 103·590	103·420 103·435	103·427	at div. 100 10 51 46,5 55 4,5 58 55	at div. 105 10 51 35 55 16 58 43	by div. 100 7 8,5 3 34,25	by div. 105 7 8,0 3 34,00	214,079
	1944	Pos.	74·84 139·30 75·74 138·80	107·070 107·520 107·270	107·295 107·395	107·345	at div. 105 11 2 18 6 2,5 9 27	at div. 110 11 2 29 5 52 9 38,5	by div. 105 7 9,0 3 34,50	by div. 110 7 9,5 3 34,75	214,617
	1945	Neg.	138·80 69·30 137·80 70·50	104·050 103·550 104·150	103·800 103·850	103·825	at div. 100 11 13 17 16 37,5 20 28,5	at div. 105 11 13 7 16 47,5 20 18	by div. 100 7 11,5 3 35,75	by div. 105 7 11,0 3 35,50	215,559
	1946	Pos.	70·50 144·12 71·90 142·90	107·310 108·010 107·400	107·660 107·705	107·682	at div. 105 11 23 52,5 27 38,5 31 4	at div. 110 11 24 2 27 29 31 14	by div. 105 7 11,5 3 35,75	by div. 110 7 12,0 3 36,00	215,884
	1947	Neg.	142·90 65·80 141·60 67·00	104·350 103·700 104·300	104·025 104·000	104·012	at div. 100 11 34 54 38 15,5 42 6,5	at div. 105 11 34 45 38 24,5 41 57	by div. 100 7 12,5 3 36,25	by div. 105 7 12,0 3 36,00	216,049
	1948	Pos.	67·00 148·00 68·30 146·90	107·500 108·150 107·600	107·825 107·875	107·850	at div. 105 11 45 31,5 49 17 52 44	at div. 110 11 45 40 49 9 52 52,5	by div. 105 7 12,5 3 36,25	by div. 110 7 12,5 3 36,25	216,250
T=48·05 B=29·620	1949	Neg.	146·90 61·80 145·82 62·90	104·350 103·810 104·360	104·080 104·085	104·082	at div. 100 11 56 53 59 56 0 3 45	at div. 105 11 56 25 0 0 4 3 37	by div. 100 7 12,0 3 36,0	by div. 105 7 12,0 3 36,0	216,000
			The wind experi observ	was very ments; ed, but no	violent and occa *lateral* dis	and *gusty* sionally a turbance	during the slight dancing took place.	whole of the motion of the	time of torsion rod	these was	

54th SERIES continued.—2½-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
March 27 T = 46·70 B = 29·784	1950	Pos.	95·44 117·92 95·90 117·52	106·680 106·910 106·710	106·795 106·810	106·802	at div. 105 9 53 57 57 53,5 10 1 4,5	at div. 110 9 54 28 57 22 10 1 36,5	by div. 105 7 7,5 3 33,75	by div. 110 7 8,5 3 34,25	* 213,930
	1951	Neg.	117·52 88·90 116·88 89·38	103·210 102·890 103·130	103·050 103·010	103·030	at div. 100 10 5 9 8 13 12 16,5	at div. 105 10 4 45 8 37,5 11 51,5	by div. 100 7 7,5 3 33,75	by div. 105 7 6,5 3 33,25	213,447
	1952	Pos.	89·38 123·72 89·94 123·20	106·550 106·830 106·570	106·690 106·700	106·695	at div. 105 10 15 32,5 19 19,5 22 39,5	at div. 110 10 15 52,5 18 59,5 23 0	by div. 105 7 7,0 3 33,50	by div. 110 7 7,5 3 33,75	213,585
	1953	Neg.	123·20 83·00 122·54 83·56	103·100 102·770 103·050	102·935 102·910	102·922	at div. 100 10 26 32,5 29 46 33 39,5	at div. 105 10 26 15,5 30 3,5 33 22	by div. 100 7 7,0 3 33,50	by div. 105 7 6,5 3 33,25	213,354
	1954	Pos.	83·56 129·28 84·10 128·68	106·420 106·690 106·390	106·555 106·540	106·547	at div. 105 10 37 1 40 43,5 44 7,5	at div. 110 10 37 16 40 28,5 44 23	by div. 105 7 6,5 3 33,25	by div. 110 7 7,0 3 33,50	213,327
	1955	Neg.	128·68 77·28 127·94 77·80	102·980 102·610 102·870	102·795 102·740	102·767	at div. 100 10 47 55 51 14 55 2	at div. 105 10 47 42 51 27,5 54 49	by div. 100 7 7,0 3 33,5	by div. 105 7 7,0 3 33,5	213,500
	1956	Pos.	77·80 134·88 78·68 134·32	106·340 106·780 106·500	106·560 106·640	106·600	at div. 105 10 58 26 11 2 7,5 5 33,5	at div. 110 10 58 38 11 1 55,5 5 45,5	by div. 105 7 7,5 3 33,75	by div. 110 7 7,5 3 33,75	213,750
	1957	Neg.	134·32 72·20 133·80 72·90	103·260 103·000 103·350	103·130 103·175	103·152	at div. 100 11 9 19 12 40 16 27,5	at div. 105 11 9 8,5 12 51 16 16,5	by div. 100 7 8,5 3 34,25	by div. 105 7 8,0 3 34,00	214,092
	1958	Pos.	72·90 140·80 73·60 140·20	106·850 107·200 106·900	107·025 107·050	107·037	at div. 105 11 19 52 23 33,5 27 59	at div. 110 11 20 2 23 23 27 9,5	by div. 105 7 7,0 3 33,50	by div. 110 7 7,5 3 33,75	213,602
	1959	Neg.	140·20 67·10 139·20 68·40	103·650 103·150 103·800	103·400 103·475	103·437	at div. 100 11 30 45 34 7 37 55	at div. 105 11 30 35,5 34 16,5 37 45	by div. 100 7 10,0 3 35,00	by div. 105 7 9,5 3 34,75	214,828
	1960	Pos.	68·40 145·50 69·92 144·26	106·950 107·710 107·090	107·330 107·400	107·365	at div. 105 7 41 21 45 4,5 48 31	at div. 110 7 41 30 44 55,5 48 40,5	by div. 105 7 10,0 3 35,00	by div. 110 7 10,5 3 35,25	215,118
Continued.	1961	Neg.	144·26 63·90 142·90 65·20	104·080 103·400 104·050	103·740 103·725	103·732	at div. 100 11 52 18,5 55 41 59 29,5	at div. 105 11 52 10 55 50 59 21	by div. 100 7 11,0 3 35,5	by div. 105 7 11,0 3 35,5	215,500

54th SERIES continued.—2½-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1962	Pos.	65·20 149·20 66·92 148·20	107·200 108·060 107·560	107·630 107·810	107·720	at div. 105 0 2 54,5 6 38,5 10 4,5	at div. 110 0 3 3 6 30,5 10 13	by div. 105 7 10,0 3 35,0	by div. 110 7 10,0 3 35,0	* 213,000
T = 47·10 B = 29·800	1963	Neg.	148·20 60·70 146·94 61·86	104·450 103·820 104·400	104·135 104·110	104·122	at div. 100 0 13 32 19 14,5 21 3	at div. 105 0 13 44 17 22,5 20 55	by div. 100 7 11,0 3 33,3	by div. 105 7 11,0 3 35,5	215,500
Mar. 28 T = 48·18 B = 29·732	1964	Pos.	91·30 121·78 92·00 121·30	106·540 106·890 106·750	106·715 106·820	106·767	at div. 103 9 44 41 48 33,5 51 53	at div. 110 9 45 4 48 10 52 17	by div. 103 7 12,0 3 36,0	by div. 110 7 13,0 3 36,3	216,177
	1965	Neg.	121·50 84·90 121·12 83·40	103·200 103·010 103·260	103·105 103·133	103·120	at div. 100 9 35 52 59 3 10 3 6	at div. 103 9 55 33 39 24 10 2 46,5	by div. 100 7 14,0 3 37,00	by div. 103 7 13,5 3 36,73	216,844
	1966	Pos.	85·40 128·30 86·08 127·90	106·830 107·190 106·990	107·010 107·090	107·055	at div. 103 10 6 26 10 15,5 13 38,5	at div. 110 10 6 42 9 39,5 13 55	by div. 105 7 12,5 3 36,25	by div. 110 7 13,0 3 36,50	216,353
	1967	Neg.	127·90 79·12 127·38 79·88	103·510 103·230 103·630	103·380 103·440	103·410	at div. 100 10 17 33 20 5 24 46,5	at div. 103 10 17 19 21 4,5 24 32	by div. 100 7 13,3 3 36,75	by div. 105 7 13,0 3 36,50	216,580
	1968	Pos.	79·88 134·38 80·78 133·80	107·130 107·580 107·290	107·355 107·435	107 395	at div. 105 10 28 9,3 31 58 35 22	at div. 110 10 28 22 31 45 33 33	by div. 103 7 12,5 3 36,23	by div. 110 7 13,0 3 36,50	216,370
	1969	Neg.	133·80 74·20 132·88 75·20	104·000 103·340 104·040	103·770 103·790	103·780	at div. 100 10 39 13,5 42 33 46 30	at div. 105 10 39 3,3 42 46,5 46 17,5	by div. 100 7 14,5 3 37,23	by div. 103 7 14,0 3 37,00	217,061
	1970	Pos.	73·20 139·60 76·34 138·62	107·400 107·970 107·480	107·683 107·725	106·705	at div. 105 10 49 53 53 42 57 7	at div. 110 10 30 4 53 31 57 18	by div. 105 7 14,0 3 37,0	by div. 110 7 14,0 3 37,0	217,000
	1971	Neg.	138·62 69·80 137·50 70·90	104·210 103·650 104·200	103·930 103·923	103·927	at div. 100 11 0 39 4 20 8 12,5	at div. 105 11 0 49 4 30 8 2,3	by div. 100 7 13,5 3 36,75	by div. 103 7 13,5 3 36,75	216,750
	1972	Pos.	70·90 143·98 72·18 142·90	107·440 108·080 107·540	107·760 107·810	107·785	at div. 103 11 11 36,5 15 24 18 49,5	at div. 110 11 11 46 15 14 19 39,5	by div. 105 7 13,0 3 36,50	by div. 110 7 13,5 3 36,75	216,639
Continued.	1973	Neg.	142·90 65·72 141·78 66·88	104·310 103·750 104·330	104·030 104·040	104·035	at div. 100 11 22 40 26 2 29 53	at div. 105 11 22 31 26 11 29 44	by div. 100 7 13,0 3 36,5	by div. 103 7 13,0 3 36,5	216,500

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1974	Pos.	66·88 148·22 68·20 147·00	107·550 108·210 107·600	107·880 107·905	107·892	at div. 105 11 33 18,5 37 5 40 31	at div. 110 11 33 27 36 56 40 40	by div. 105 7 12,5 3 36,25	by div. 110 7 13,0 3 36,50	216,395
	1975	Neg.	147·00 61·80 145·78 63·08	104·400 103·790 104·430	104·095 104·110	104·102	at div. 100 11 44 20 47 43 51 32,5	at div. 105 11 44 12 47 51,5 51 24,5	by div. 100 7 12,5 3 36,25	by div. 105 7 12,5 3 36,25	216,250
	1976	Pos.	63·08 152·06 64·56 150·80	107·570 108·310 107·680	107·940 107·995	107·967	at div. 105 11 54 58,5 58 44 0 2 11	at div. 110 11 55 6 58 36 0 2 19	by div. 105 7 12,5 3 36,25	by div. 110 7 13,0 3 36,50	216,398
	1977	Neg.	150·80 58·30 149·38 59·70	104·550 103·840 104·540	104·195 104·190	104·192	at div. 100 0 5 58,5 9 22 13 11	at div. 105 0 5 51 9 30 13 3	by div. 100 7 12,5 3 36,25	by div. 105 7 12,0 3 36,00	216,040
T=49·11 B=29·758	1978	Pos.	59·70 155·60 61·20 154·10	107·650 108·400 107·650	108·025 108·025	108·025	at div. 105 0 16 37,5 20 21 23 49	at div. 110 0 16 44,5 20 14 23 56,5	by div. 105 7 11,5 3 35,75	by div. 110 7 12,0 3 36,00	215,901
March 29 T=52·18 B=29·932	1979	Pos.	87·60 127·84 88·28 127·30	107·720 108·060 107·790	107·890 107·925	107·907	at div. 105 9 55 50 59 46,5 10 3 2,5	at div. 110 9 56 7 59 29 10 3 20	by div. 105 7 12,5 3 36,25	by div. 110 7 13,0 3 36,50	216,395
	1980	Neg.	127·30 81·10 126·70 81·72	104·200 103·900 104·210	104·050 104·055	104·052	at div. 100 10 7 3,5 10 16 14 17	at div. 105 10 6 48,5 10 31 14 1,5	by div. 100 7 13,5 3 36,75	by div. 105 7 13,0 3 36,50	216,547
	1981	Pos.	81·72 133·62 82·50 132·92	107·670 108·060 107·710	107·865 107·885	107·875	at div. 105 10 17 35 21 27,5 24 48	at div. 110 10 17 48,5 21 14 25 1,5	by div. 105 7 13,0 3 36,5	by div. 110 7 13,0 3 36,5	216,500
	1982	Neg.	132·92 75·70 132·20 76·50	104·310 103·950 104·350	104·130 104·150	104·140	at div. 100 10 28 44 32 0 35 57	at div. 105 10 28 32 32 12,5 35 44,5	by div. 100 7 13,0 3 36,50	by div. 105 7 12,5 3 36,25	216,293
	1983	Pos.	76·50 138·90 77·52 138·00	107·700 108·210 107·760	107·955 107·985	107·970	at div. 105 10 39 19 43 9 46 32	at div. 110 10 39 30 42 57,5 46 43	by div. 105 7 13,0 3 36,5	by div. 110 7 13,0 3 36,5	216,500
	1984	Neg.	138·00 70·82 137·00 71·84	104·410 103·910 104·420	104·160 104·165	104·162	at div. 100 10 50 25,5 53 45 57 39	at div. 105 10 50 15 53 55,5 57 28	by div. 100 7 13,5 3 36,75	by div. 105 7 13,0 3 36,50	216,542
Continued.	1985	Pos.	71·84 143·68 73·02 142·64	107·760 108·350 107·830	108·055 108·090	108·072	at div. 105 11 1 2,5 4 50,5 8 15	at div. 110 11 1 12 4 41 8 24,5	by div. 105 7 12,5 3 36,25	by div. 110 7 12,5 3 36,25	216,250

54th Series continued.—2½-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1986	Neg.	142·64 66·50 141·50 67·70	104·570 104·000 104·600	104·283 104·300	104·292	at div. 100 11 12 6,5 15 28 19 20	at div. 105 11 11 57,5 15 37 19 10,5	by div. 100 7 13,5 3 36,75	by div. 105 7 13,0 3 56,50	• 216,535
	1987	Pos.	66·70 147·82 68·90 146·70	107·760 108·360 107·800	108·060 108·080	108·070	at div. 105 11 22 44 26 31 29 57	at div. 110 11 22 53 26 22,5 30 6	by div. 105 7 13,0 5 36,5	by div. 110 7 13,0 3 36,5	216,500
	1988	Neg.	146·70 62·30 145·50 63·80	104·600 104·000 104·650	104·300 104·325	104·312	at div. 100 11 33 47 37 8 40 59,5	at div. 105 11 33 38,5 37 17 40 51	by div. 100 7 12,3 3 36,25	by div. 105 7 12,5 3 36,25	216,250
	1989	Pos.	63·80 151·80 65·20 150·52	107·800 108·500 107·860	108·130 108·180	108·165	at div. 105 11 44 25 48 11 51 57,5	at div. 110 11 44 33 48 3,5 51 45,5	by div. 105 7 12,5 3 36,25	by div. 110 7 12,3 3 36,25	216,250
	1990	Neg.	150·52 58·86 149·20 60·20	104·690 104·030 104·700	104·360 104·365	104·362	at div. 100 11 55 26,5 58 49,3 0 2 39	at div. 105 11 55 19 58 37 0 2 31	by div. 100 7 12,3 3 36,25	by div. 105 7 12,0 3 36,00	216,032
	1991	Pos.	60·20 155·26 61·80 153·80	107·730 108·530 107·800	108·130 108·165	108·147	at div. 105 0 6 6 9 51,5 13 18	at div. 110 0 6 13 9 44 13 25,5	by div. 105 7 12,0 3 36,00	by div. 110 7 12,5 3 36,25	216,157
T = 52·76 B = 29·996	1992	Neg.	153·80 55·60 152·30 57·00	104·700 103·930 104·650	104·325 104·300	104·312	at div. 100 0 17 5,5 20 29,5 24 17,5	at div. 105 0 16 58,5 20 36,5 24 10,5	by div. 100 7 12,0 3 36,0	by div. 105 7 12,0 3 36,0	216,000
March 30 T = 54·50 B = 29·900	1993	Pos.	96·26 117·02 96·70 116·90	106·640 106·860 106·800	106·750 106·850	106·790	at div. 105 9 49 17 53 17,5 56 29,5	at div. 110 9 49 51 52 43,5 57 4	by div. 105 7 12,3 3 36,25	by div. 110 7 13,0 3 36,50	216,339
	1994	Neg.	116·90 89·38 116·62 89·74	103·140 103·000 103·180	103·070 103·090	103·080	at div. 100 10 0 38,5 5 44 7 52,5	at div. 105 10 0 15,5 4 10 7 26,5	by div. 100 7 14,0 3 37,0	by div. 105 7 13,0 3 36,5	216,692
	1995	Pos.	89·74 123·88 90·28 123·32	106·810 107·080 106·900	106·945 106·990	106·967	at div. 105 10 11 9 15 2 18 22	at div. 110 10 11 29,5 14 41 18 45	by div. 105 7 13,0 5 36,50	by div. 110 7 13,5 3 36,75	216,598
	1996	Neg.	123·52 83·00 123·08 83·50	105·260 103·040 103·290	103·150 103·165	103·157	at div. 100 10 22 21 25 35,5 29 35	at div. 105 10 22 3,5 25 53 29 17	by div. 100 7 14,0 3 37,00	by div. 105 7 13,5 5 36,75	216,842
Continued.	1997	Pos.	83·50 130·24 84·12 129·80	106·870 107·180 106·960	107·025 107·070	107·047	at div. 105 10 52 56 36 45 40 9	at div. 110 10 33 11 36 30 40 24,5	by div. 105 7 13,0 3 36,50	by div. 110 7 13,5 3 36,75	216,398

54th SERIES continued.—2½-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	1998	Neg.	129·80 77·04 129·20 77·70	103·420 103·120 103·450	103·270 103·285	103·277	at div. 100 10 44 2,5 47 21,5 51 15,5	at div. 105 10 43 49 47 35 51 2	by div. 100 7 13,0 3 36,5	by div. 105 7 13,0 3 36,5	216,500
	1999	Pos.	77·70 136·30 78·40 135·66	107·000 107·350 107·030	107·175 107·190	107·182	at div. 105 10 54 40 58 27 11 1 53	at div. 110 10 54 52 58 15 11 2 5	by div. 105 7 13,0 3 36,5	by div. 110 7 13,0 3 36,5	216,500
	2000	Neg.	135·66 71·60 134·86 72·40	103·630 103·230 103·630	103·430 103·430	103·430	at div. 100 11 5 43,5 9 5,5 12 57	at div. 105 11 5 33 9 16,5 12 46	by div. 100 7 13,5 3 36,75	by div. 105 7 13,0 3 36,50	216,579
	2001	Pos.	72·40 141·70 73·40 140·90	107·050 107·550 107·150	107·300 107·350	107·325	at div. 105 11 16 23 20 9 23 36	at div. 110 11 16 33 19 58,5 23 46	by div. 105 7 13,0 3 36,5	by div. 110 7 13,0 3 36,5	216,500
	2002	Neg.	140·90 66·78 139·90 67·80	103·840 103·340 103·850	103·590 103·595	103·592	at div. 100 11 27 25,5 30 49 34 39	at div. 105 11 27 16 30 58,5 34 29	by div. 100 7 13,5 3 36,75	by div. 105 7 13,0 3 36,50	216,570
	2003	Pos.	67·80 146·48 68·92 145·40	107·140 107·700 107·160	107·420 107·430	107·425	at div. 105 11 38 6 41 51 45 19	at div. 110 11 38 15 41 42 45 28	by div. 105 7 13,0 3 36,5	by div. 110 7 13,0 3 36,5	216,500
T = 54·75 B = 29·878	2004	Neg.	145·40 62·50 144·20 63·62	103·950 103·350 103·910	103·650 103·630	103·640	at div. 100 11 49 7 52 31 56 20	at div. 105 11 48 58,5 52 39,5 56 11,5	by div. 100 7 13,0 3 36,5	by div. 105 7 13,0 3 36,5	216,500

55th SERIES.—2-inch Lead balls (with *brass rod*), bifilar *iron* wire; distance = ·415 inch.

April 17 T = 47·05 B = 30·216	2005	Pos.	95·68 112·00 95·90 111·82	103·840 103·950 103·860	103·895 103·905	103·900	at div. 102 9 57 25 10 0 48 3 17	at div. 104 9 57 39,5 10 0 34 3 31,5	by div. 102 5 52,0 2 56,0	by div. 104 5 52,0 2 56,0	176,000
	2006	Neg.	111·82 91·48 111·68 91·56	101·650 101·580 101·620	101·615 101·600	101·607	at div. 100 10 6 38,5 9 17 12 30,5	at div. 102 10 6 27 9 28,5 12 19	by div. 100 5 52,0 2 56,0	by div. 102 5 52,0 2 56,0	176,000
	2007	Pos.	91·56 116·00 91·94 115·80	103·780 103·970 103·870	103·875 103·920	103·897	at div. 102 10 15 12,5 18 26 21 4,5	at div. 104 10 15 22 18 16 21 14	by div. 102 5 52,0 2 56,0	by div. 104 5 52,0 2 56,0	176,000
Continued.	2008	Neg.	115·80 87·58 115·50 87·80	101·690 101·540 101·650	101·615 101·595	101·605	at div. 100 10 24 18 27 1 30 10	at div. 102 10 24 10 27 9 30 2	by div. 100 5 52,0 2 56,0	by div. 102 5 52,0 2 56,0	176,000

55th SERIES cont.—2-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; dist. = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2009	Pos.	87·80 119·60 88·12 119·30	103·700 103·860 103·710	103·780 103·785	103·782	at div. 102 10 32 56 36 4 38 48	at div. 104 10 33 3 35 57 38 55	by div. 102 5 52,0 2 56,0	by div. 104 5 52,0 2 56,0	176,000
	2010	Neg.	119·30 83·88 118·88 84·24	101·590 101·380 101·560	101·485 101·470	101·477	at div. 100 10 42 57 44 43,5 47 49	at div. 102 10 42 50 44 50 47 42	by div. 100 5 52,0 2 56,0	by div. 102 5 52,0 2 56,0	176,000
	2011	Pos.	84·24 123·10 84·68 122·80	103·670 103·890 103·740	103·780 103·815	103·797	at div. 100 10 50 30,5 53 49 56 22,5	at div. 105 10 50 45,5 53 34,5 56 37,5	by div. 100 5 52,0 2 56,0	by div. 105 5 52,0 2 56,0	176,000
T = 47·28 B = 30·208	2012	Neg.	122·80 80·40 122·32 80·74	101·600 101·360 101·530	101·480 101·445	101·462	at div. 100 10 59 35,5 11 2 23,5 5 27,5	at div. 105 10 59 21,5 11 2 37 5 13,5	by div. 100 5 52,0 2 56,0	by div. 105 5 52,0 2 56,0	176,000
April 18 T = 48·06 B = 30·228	2013	Neg.	113·90 86·28 113·60 86·52	100·090 99·940 100·060	100·015 100·000	100·007	at div. 100 9 40 53,5 43 46 46 46,5	at div. 105 9 40 32,5 44 11 46 25	by div. 100 5 53,0 2 56,50	by div. 105 5 52,5 2 56,25	176,500
	2014	Pos.	86·52 117·88 86·90 117·58	102·200 102·390 102·240	102·295 102·315	102·305	at div. 100 9 49 37 52 50 55 30	at div. 105 9 49 55 52 32 55 48,5	by div. 100 5 53,0 2 56,50	by div. 105 5 53,5 2 56,75	176,615
	2015	Neg.	117·58 82·68 117·06 83·00	100·130 99·870 100·030	100·000 99·950	99·975	at div. 100 9 58 36,5 10 1 17 4 29,5	at div. 105 9 58 20,5 10 1 33,5 4 13	by div. 100 5 53,0 2 56,50	by div. 105 5 52,5 2 56,25	176,500
	2016	Pos.	83·00 121·32 83·52 120·90	102·160 102·420 102·210	102·290 102·315	102·302	at div. 100 10 7 21 10 32 13 14,5	at div. 105 10 7 36 10 17 13 30	by div. 100 5 53,5 2 56,75	by div. 105 5 54,0 2 57,00	176,865
	2017	Neg.	120·90 79·32 120·48 79·80	100·110 99·900 100·140	100·005 100·020	100·012	at div. 100 10 16 19,5 19 16,5 22 13	at div. 105 10 16 6 19 30,5 21 59	by div. 100 5 53,5 2 56,75	by div. 105 5 53,0 2 56,50	176,749
	2018	Pos.	79·80 124·70 80·40 124·20	102·250 102·550 102·300	102·400 102·425	102·412	at div. 100 10 25 5 28 14 30 58	at div. 105 10 25 17,5 28 1 31 11	by div. 100 5 53,0 2 56,50	by div. 105 5 53,5 2 56,75	176,621
	2019	Neg.	124·20 76·50 123·68 77·28	100·350 100·090 100·480	100·220 100·285	100·252	at div. 100 10 34 3 36 59 39 57	at div. 105 10 33 51 37 11 39 44,5	by div. 100 5 54,0 2 57,00	by div. 105 5 53,5 2 56,75	176,987
Continued.	2020	Pos.	77·28 127·68 78·10 126·90	102·480 102·890 102·500	102·685 102·695	102·690	at div. 100 10 42 48 45 57 48 42	at div. 105 10 42 59,5 45 46 48 53,5	by div. 100 5 54,0 2 57,0	by div. 105 5 54,0 2 57,0	177,000

55th Series cont.—2-inch Lead balls (with *brass rod*), bifilar *iron* wire; dist. = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2021	Neg.	126·90 74·30 126·08 75·00	100·600 100·190 100·540	100·395 100·365	100·380	at div. 100 10 51 45,5 54 41 57 39,5	at div. 105 10 51 35 54 52 57 28,5	by div. 100 5 54,0 2 57,00	by div. 105 5 53,5 2 56,75	s 176,981
	2022	Pos.	75·00 129·84 75·92 129·06	102·420 102·880 102·490	102·650 102·685	102·667	at div. 100 11 0 32 3 40 6 25,5	at div. 105 11 0 42,5 3 29,5 6 36,5	by div. 100 5 53,5 2 56,75	by div. 105 5 54,0 2 57,00	176,883
	2023	Neg.	129·06 72·22 128·08 72·90	100·640 100·150 100·490	100·395 100·320	100·357	at div. 100 11 9 30,5 12 26 15 24	at div. 105 11 9 20,5 12 36,5 15 14	by div. 100 5 53,5 2 56,75	by div. 105 5 53,5 2 56,75	176,750
T=48·45 B=30·228	2024	Pos.	72·90 131·92 73·80 131·20	102·410 102·860 102·500	102·635 102·680	102·657	at div. 100 11 18 16 21 23,5 24 10	at div. 105 11 18 26 21 14 24 20	by div. 100 5 54,0 2 57,0	by div. 105 5 54,0 2 57,0	177,000

56th Series.—Brass rod *alone*, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
April 19 T=48·83 B=30·242	2025	Pos.	94·46 99·30 94·60 99·22	96·880 96·950 96·910	96·915 96·930	96·922	at div. 96 10 0 7 2 28,5 3 54	at div. 97 10 0 22,5 2 13 4 10,5	by div. 96 3 47,0 1 53,5	by div. 97 3 48,0 1 54,0	113,961
	2026	Neg.	99·22 93·40 99·08 93·30	96·310 96·240 96·190	96·275 96·215	96·245	at div. 96 10 6 10 7 58,5 9 58,5	at div. 97 10 5 58 8 11,5 9 46	by div. 96 3 48,5 1 54,25	by div. 97 3 48,0 1 54,00	114,189
	2027	Pos.	93·30 100·20 93·60 100·14	96·750 96·900 96·870	96·825 96·885	96·855	at div. 96 10 11 44 13 57 15 32	at div. 97 10 11 55 13 46 15 43,5	by div. 96 3 48,0 1 54,00	by div. 97 3 48,5 1 54,25	114,214
	2028	Neg.	100·14 92·48 99·98 92·50	96·310 96·230 96·240	96·270 96·235	96·252	at div. 96 10 17 40,5 19 31 21 28	at div. 97 10 17 30,5 19 40 21 18	by div. 96 3 47,5 1 53,75	by div. 97 3 47,5 1 53,75	113,750
	2029	Pos.	92·50 101·10 92·72 100·94	96·800 96·910 96·830	96·855 96·870	96·862	at div. 96 10 23 15 25 24 27 3,5	at div. 97 10 23 24 25 15,5 27 12,5	by div. 96 3 48,5 1 54,25	by div. 97 3 48,5 1 54,25	114,250
	2030	Neg.	100·94 91·58 100·72 91·76	96·260 96·150 96·240	96·205 96·195	96·200	at div. 96 10 29 9 13 1,5 32 58	at div. 97 10 29 1 31 9,5 32 50	by div. 96 3 49,0 1 54,5	by div. 97 3 49,0 1 54,5	114,500
Continued.	2031	Pos.	91·76 101·80 91·90 101·62	96·780 96·850 96·760	96·815 96·805	96·810	at div. 96 10 34 47 36 53 38 35,5	at div. 97 10 34 54 36 45,5 38 43	by div. 96 3 48,5 1 54,25	by div. 97 3 49,0 1 54,50	114,452

56th SERIES continued.—Brass rod *alone*, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=48·88 B=30·240	2032	Neg.	101·62 90·88 101·32 91·12	96·250 96·100 96·220	97·175 96·160	96·167	at div. 96 10 40 38 42 31 44 27	at div. 97 10 40 31,5 42 37,5 44 20	by div. 96 3 49,0 1 54,50	by div. 97 3 48,5 1 54,25	114,458
April 20 T=48·98 B=30·188	2033	Pos.	99·90 114·10 100·20 113·82	107·000 107·150 107·010	107·075 107·080	107·077	at div. 106 9 49 40 51 44,5 53 28	at div. 108 9 49 50 51 34 53 38,5	by div. 106 3 48,0 1 54,00	by div. 108 3 48,5 1 54,25	114,135
	2034	Neg.	113·82 99·14 113·50 99·40	106·480 106·320 106·450	106·400 106·385	106·392	at div. 106 9 55 30,5 57 21,5 59 19	at div. 108 9 55 20,5 57 32 59 8,5	by div. 106 3 48,5 1 54,25	by div. 108 3 48,0 1 54,00	114,201
	2035	Pos.	99·40 114·50 99·72 114·20	106·950 107·110 106·960	107·030 107·035	107·032	at div. 106 10 1 8 3 12 4 57	at div. 108 10 1 18 3 2,5 5 7	by div. 106 3 49,0 1 54,5	by div. 108 3 49,0 1 54,5	114,500
	2036	Neg.	114·20 98·68 113·86 98·90	106·440 106·270 106·380	106·355 106·325	106·340	at div. 106 10 6 58,5 8 50 10 47	at div. 108 10 6 49 9 0 10 37	by div. 106 3 48,5 1 54,25	by div. 108 3 48,0 1 54,00	114,208
	2037	Pos.	98·90 114·84 99·20 114·54	106·870 107·020 106·870	106·945 106·945	106·945	at div. 106 10 12 36,5 14 39,5 16 25	at div. 108 10 12 46 14 30 16 35	by div. 106 3 48,5 1 54,25	by div. 108 3 49,0 1 54,50	114,368
	2038	Neg.	114·54 98·20 114·20 98·48	106·370 106·200 106·340	106·285 106·270	106·277	at div. 106 10 18 25,5 20 18 22 14	at div. 108 10 18 17 20 27 22 5	by div. 106 3 48,5 1 54,25	by div. 108 3 48,0 1 54,00	114,215
	2039	Pos.	98·48 115·20 98·74 114·88	106·840 106·970 106·810	106·905 106·890	106·897	at div. 106 10 24 5 26 6,5 27 53	at div. 108 10 24 13,5 25 57,5 28 2	by div. 106 3 48,0 1 54,00	by div. 108 3 48,5 1 54,25	114,112
	2040	Neg.	114·88 97·72 114·56 98·00	106·300 106·140 106·280	106·220 106·210	106·215	at div. 106 10 29 53 31 46 33 41,5	at div. 108 10 29 44,5 31 55 33 33	by div. 106 3 48,5 1 54,25	by div. 108 3 48,5 1 54,25	114,250
	2041	Pos.	98·00 115·54 98.48 115·20	106·770 107·010 106·840	106·890 106·925	106·907	at div. 106 10 34 33 37 34,5 39 21	at div. 108 10 34 41,5 37 26 39 30	by div. 106 3 48,0 1 54,00	by div. 108 3 48,5 1 54,25	114,113
	2042	Neg.	115·20 97·48 114·90 97·80	106·340 106·190 106·350	106·265 106·270	106·267	at div. 106 10 41 21 43 13,5 45 10	at div. 108 10 41 12,5 43 22 45 1	by div. 106 3 49,0 1 54,50	by div. 108 3 48,5 1 54,25	114,467
Continued.	2043	Pos.	97·80 116·00 98·30 115·78	106·900 107·150 107·040	107·025 107·095	107·060	at div. 106 10 47 0 49 2,5 50 48,5	at div. 108 10 47 8 48 54,5 50 57	by div. 106 3 48,5 1 54,25	by div. 108 3 49,0 1 54,50	114,382

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56th Series continued. — Brass rod *alone*, with bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued. T=49·28 B=30·180	2044	Neg.	115·78 97·48 115·52 98·00	106·630 106·500 106·760	106·565 106·630	106·597	at div. 106 10 52 50 54 41 56 40	at div. 108 10 52 42 54 49 56 32	by div. 106 3 50,0 1 55,0	by div. 108 3 50,0 1 55, 0	115,000

57th Series. — Brass rod *alone*, with bifilar *iron* wire; distance = ·177 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
April 21 T=51·51 B=30·190	2045	Pos.	81·60 120·06 83·14 118·20	100·830 101·600 100·670	101·215 101·135	101·175	at div. 100 10 3 33 9 15 14 31	at div. 105 10 4 1 8 46,5 15 1	by div. 100 10 58,0 5 29,0	by div. 105 11 0,0 5 30,0	329,235
	2046	Neg.	118·20 73·80 115·70 75·52	96·000 94·750 95·610	95·375 95·180	95·277	at div. 95 10 20 11,5 25 38 31 7	at div. 100 10 19 47,5 26 3 30 40,5	by div. 95 10 55,5 5 27,75	by div. 100 10 53,0 5 26,50	327,681
	2047	Pos.	75·52 124·30 77·84 122·60	99·910 101·070 100·220	100·490 100·645	100·567	at div. 100 10 36 37 42 8 47 30,5	at div. 105 10 36 58,5 41 45 47 54	by div. 100 10 53,5 5 26,75	by div. 105 10 55,5 5 27,75	326,863
	2048	Neg.	122·60 69·74 121·00 74·92	96·170 95·370 97·960	95·770 96·665	96·217	at div. 95 10 53 7 58 30,5 11 4 14,5	at div. 100 10 52 47 58 51 11 3 51,5	by div. 95 11 7,5 5 33,75	by div. 100 11 4,5 5 32,25	333,385
	2049	Pos.	74·92 132·40 79·68 129·34	103·660 106·040 104·510	104·850 105·275	105·062	at div. 105 11 9 41,5 15 12,5 20 46	at div. 110 11 10 0,5 14 52,5 21 8	by div. 105 11 4,5 5 32,25	by div. 110 11 7,5 5 33,75	332,269
	2050	Neg.	129·34 71·70 125·40 74·86	100·520 98·550 100·130	99·535 99·340	99·437	at div. 95 11 26 41 31 42 37 53	at div. 100 11 36 22 32 2 37 31	by div. 95 11 12,0 5 36,0	by div. 100 11 9,0 5 34,5	334,669
	2051	Pos.	74·86 132·66 78·72 129·00	103·760 105·690 103·860	104·725 104·775	104·750	at div. 100 11 42 57 49 10 53 9	at div. 105 11 43 15,5 48 50 54 30,5	by div. 100 11 12,0 5 36,0	by div. 105 11 15,0 5 37,5	337,425
T=52·00 B=30·174	2052	Neg.	129·00 70·82 125·70 74·80	99·910 98·260 100·250	99·085 99·255	99·170	at div. 95 0 0 22 5 29 11 44,5	at div. 100 0 0 3 5 49 11 23	by div. 95 11 22,5 5 41,25	by div. 100 11 20,0 5 40,00	340,208

58th Series. — 2½-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
April 24 T=59·31 B=29·976 Continued.	2053	Pos.	100·00 116·32 100·20 116·30	108·160 108·260 108·250	108·210 108·255	108·232	at div. 108 10 18 40 21 14 23 42,5	at div. 110 10 18 52 21 2 23 54,5	by div. 108 5 2,5 2 31,25	by div. 110 5 2,5 2 31,25	151,250

58th Series cont.—2½-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; dist. = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2054	Neg.	116·30 96·80 116·10 96·90	106·550 106·450 106·500	106·500 106·475	106·487	at div. 106 10 26 21 29 47 31 22,5	at div. 108 10 26 11 29 57 31 12	by div. 106 5 1,5 2 30,75	by div. 108 5 1,0 2 30,50	* 150,689
	2055	Pos.	96·90 119·50 97·08 119·40	108·200 108·290 108·240	108·245 108·265	108·255	at div. 108 10 33 52,5 missed. 38 55	at div. 110 10 34 1 missed. 39 3,5	by div. 108 5 2,5 3 31,25	by div. 110 5 2,5 2 31,25	151,250
	2056	Neg.	119·40 93·60 119·20 93·80	106·500 106·400 106·500	106·450 106·450	106·450	at div. 106 10 41 31 43 59 46 33,5	at div. 108 10 41 23,5 44 6,5 46 26	by div. 106 5 2,5 2 31,25	by div. 108 5 2,5 2 31,25	151,250
	2057	Pos.	93·80 122·60 94·00 122·42	108·200 108·300 108·210	108·250 108·255	108·252	at div. 105 10 48 54 51 47 43 56	at div. 110 10 49 10,5 51 30,5 44 13	by div. 105 5 2,0 2 31,00	by div. 110 5 2,5 2 31,25	151,163
	2058	Neg.	122·42 90·66 122·20 90·82	106·540 106·430 106·510	106·485 106·470	106·477	at div. 105 10 56 44 59 6,5 11 1 46,5	at div. 110 10 56 29 59 22 11 1 31,5	by div. 105 5 2,5 2 31,25	by div. 110 5 2,5 2 31,25	151,250
	2059	Pos.	90·82 125·50 91·08 125·30	108·160 108·290 108·190	108·225 108·240	108·232	at div. 105 11 4 6 6 55 9 8	at div. 110 11 4 20 6 41,5 9 22,5	by div. 105 5 2,0 2 31,00	by div. 110 5 2,5 2 31,25	151,162
	2060	Neg.	125·30 87·78 125·04 88·00	106·540 106·410 106·520	106·475 106·465	106·470	at div. 105 11 11 53 14 16 16 55,5	at div. 110 11 11 40 14 30 16 42,5	by div. 105 5 2,5 2 31,25	by div. 110 5 2,5 2 31,25	151,250
	2061	Pos.	88·00 128·22 88·32 127·92	108·110 108·270 108·120	108·190 108·195	108·192	at div. 105 11 19 16,5 22 3,5 24 19	at div. 110 11 19 29 21 51,5 24 31,5	by div. 105 5 2,5 2 31,25	by div. 110 5 2,5 2 31,25	151,250
	2062	Neg.	127 92 85·02 127·60 85·30	106·470 106·310 106·450	106·390 106·380	106·385	at div. 105 11 27 2 29 27,5 32 4,5	at div. 110 11 26 51 29 38,5 31 53	by div. 105 5 2,5 2 31,25	by div. 110 5 2,0 2 31,00	151,181
	2063	Pos.	85·30 130·84 85·70 130·50	108·070 108·270 108·100	108·170 108·185	108·177	at div. 105 11 34 27 37 12 39 29	at div. 110 11 34 37,5 37 1 39 40	by div. 105 5 2,0 2 31,00	by div. 110 5 2,5 2 31,25	151,159
T = 59·81 B = 29·976	2064	Neg.	130·50 82·52 130·10 82·90	106·510 106·310 106·500	106·410 106·405	106·407	at div. 105 11 42 11 44 37 47 13,5	at div. 110 11 42 1 44 47 47 3	by div. 105 5 2,5 2 31,25	by div. 110 5 2,0 2 31,00	151,180
April 25 T = 60·08 B = 30·088 Continued.	2065	Pos.	101·30 115·06 101·50 114·92	108·180 108·280 108·210	108·230 108·245	108·237	at div. 105 9 53 45 57 57 58 48	at div. 110 9 54 22 56 28 59 25	by div. 105 5 3,0 2 31,5	by div. 110 5 3,0 2 31,5	151,500

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	s
Continued.	2066	Neg.	114·92 98·00 114·72 98·12	106·460 106·360 106·420	106·410 106·390	106·400	at div. 105 10 1 54,5 4 9 6 57	at div. 110 10 1 25 4 39 6 27	by div. 105 5 2,5 3 31,25	by div. 110 5 2,0 2 31,00	151,180
	2067	Pos.	98·12 118·18 98·30 118·00	108·150 108·240 108·150	108·195 108·195	108·195	at div. 105 10 9 6,5 12 9 14 8,5	at div. 110 10 9 31 11 44 14 33	by div. 105 5 2,0 2 31,0	by div. 110 5 2,0 2 31,0	151,000
	2068	Neg.	118·00 94·92 117·80 95·00	106·460 106·360 106·400	106·410 106·380	106·395	at div. 105 10 17 3,5 19 23 22 5,5	at div. 110 10 16 42 19 44,5 21 44	by div. 105 5 2,0 2 31,0	by div. 110 5 2,0 2 31,0	151,000
	2069	Pos.	95·00 121·20 95·26 121·00	108·100 108·230 108·130	108·165 108·180	108·172	at div. 105 10 24 21,5 27 16 29 24	at div. 110 10 24 40 26 57,5 29 42,5	by div. 105 5 2,5 2 31,25	by div. 110 5 2,5 2 31,25	151,250
	2070	Neg.	121·00 91·90 120·80 92·08	106·450 106·350 106·440	106·400 106·395	106·397	at div. 105 10 32 13 34 35 37 15,5	at div. 110 10 31 56 34 52 36 58,5	by div. 105 5 2,5 2 31,25	by div. 110 5 2,5 2 31,25	151,250
	2071	Pos.	92·08 124·10 92·38 123·92	108·090 108·240 108·150	108·165 108·195	108·180	at div. 105 10 39 34 42 24,5 44 36,5	at div. 110 10 39 49 42 9 44 51,5	by div. 105 5 2,5 2 31,25	by div. 110 5 2,5 2 31,25	151,250
	2072	Neg.	123·92 89·00 123·68 89·20	106·460 106·340 107·440	106·400 106·390	106·395	at div. 105 10 47 22 49 46 52 24,5	at div. 110 10 47 8,5 50 0 52 10,5	by div. 105 5 2,5 2 31,25	by div. 110 5 2,0 2 31,00	151,180
	2073	Pos.	89·20 127·00 89·50 126·80	108·100 108·250 108·150	108·175 108·200	108·187	at div. 105 10 54 45 57 32,5 59 47	at div. 110 10 54 58 57 19 11 0 0	by div. 105 5 2,0 2 31,0	by div. 110 5 2,0 2 31,0	151,000
	2074	Neg.	126·80 86·22 126·52 86·34	106·510 106·370 106·430	106·440 106·400	106·420	at div. 105 11 2 30,5 4 55,5 . 7 32,5	at div. 110 11 2 18,5 5 7 7 20,5	by div. 105 5 2,0 2 31,0	by div. 110 5 2,0 2 31,0	151,000
	2075	Pos.	86·34 129·80 86·60 129·50	108·070 108·200 108·050	108·135 108·125	108·130	at div. 105 11 9 54,5 12 39,5 14 57	at div. 110 11 10 6 12 28,5 15 8,5	by div. 105 5 2,5 2 31,25	by div. 110 5 2,5 2 31,25	151,250
T = 60·45 B = 30·100	2076	Neg.	129·50 83·36 129·20 83·60	106·430 106·280 106·400	106·355 106·340	106·347	at div. 105 11 17 39 20 4 22 41	at div. 110 11 17 28,5 20 14,5 22 30,5	by div. 105 5 2,0 2 31,0	by div. 110 5 2,0 2 31,0	151,000

59th Series.—2-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; distance = ·415 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
April 26 T=60·37 B=30·110	2077	Pos.	99·60 112·92 99·80 112·80	106·260 106·360 106·300	106·310 106·330	106·320	at div. 106 9 56 43 58 53 10 0 55	at div. 108 9 56 55,5 58 41 10 1 8	by div. 106 4 12,0 2 6,00	by div. 108 4 12,5 2 6,25	126,040
	2078	Neg.	112·80 97·50 112·60 97·60	105·150 105·050 105·100	105·100 105·075	105·087	at div. 104 10 3 11 4 6 7 23	at div. 106 10 3 0 4 16,5 7 12	by div. 104 4 12,0 2 6,0	by div. 106 4 12,0 2 6,0	126,000
	2079	Pos.	97·60 114·74 97·80 114·60	106·170 106·270 106·200	106·220 106·235	106·227	at div. 106 10 9 24,5 11 32 13 37	at div. 108 10 9 34 11 23 13 46,5	by div. 106 4 12,5 2 6,25	by div. 108 4 12,5 2 6,25	126,250
	2080	Neg.	114·60 95·50 114·30 95·60	105·050 104·900 104·950	104·975 104·925	104·950	at div. 104 10 15 49 17 47 20 1	at div. 106 10 15 40 17 56 19 52	by div. 104 4 12,0 2 6,0	by div. 106 4 12,0 2 6,0	126,000
	2081	Pos.	95·60 116·50 95·88 116·28	106·050 106·190 106·080	106·120 106·135	106·127	at div. 105 10 22 0 24 14,5 26 12	at div. 110 10 22 20 23 55 26 32	by div. 105 4 12,0 2 6,0	by div. 110 4 12,0 2 6,0	126,000
	2082	Neg.	116·28 93·70 115·92 93·84	104·990 104·810 104·880	104·900 104·845	104·872	at div. 100 10 28 42 30 12 32 54	at div. 105 10 28 23,5 30 30,5 32 35	by div. 100 4 12,0 2 6,00	by div. 105 4 11,5 2 5,75	125,756
	2083	Pos.	93·84 118·00 94·00 117·80	105·920 106·000 105·900	105·960 105·950	105·955	at div. 105 10 34 40 36 52 38 52	at div. 110 10 34 57 36 35,5 39 9	by div. 105 4 12,0 2 6,0	by div. 110 4 12,0 2 6,0	126,000
	2084	Neg.	117·80 91·90 117·60 92·00	104·850 104·750 104·800	104·800 104·775	104·787	at div. 100 10 41 17,5 42 53 45 29,5	at div. 105 10 41 2 43 9 45 13,5	by div. 100 4 12,0 2 6,00	by div. 105 4 11,5 2 5,75	125,761
T=60·47 B=30·100	2085	Pos.	92·00 119·75 92·20 119·50	105·875 105·975 105·850	105·925 105·912	105·918	at div. 105 10 47 18,5 49 30 57 30	at div. 110 10 47 33 49 15 51 45	by div. 105 4 11,5 2 5,75	by div. 110 4 12,0 2 6,00	125,796

60th Series.—2½-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; distance = ·367 inch.

May 3 T=58·81 B=29·990	2086	Pos.	84·80 126·32 85·20 125·80	105·560 105·760 105·500	105·660 105·630	105·645	at div. 105 9 49 13,5 52 2 55 44	at div. 110 9 49 28,5 51 47 55 59,5	by div. 105 6 30,5 3 15,25	by div. 110 6 31,0 3 15,50	195,282
Continued.	2087	Neg.	125·80 79·80 125·00 80·22	102·800 102·400 102·610	102·600 102·505	102·552	at div. 100 9 59 9,5 10 2 10 5 38,5	at div. 105 9 58 56 10 2 24 5 24,5	by div. 100 6 29,0 3 14,50	by div. 105 6 28,5 3 14,25	194,372

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2088	Pos.	80·22 130·30 80·80 129·80	105·260 105·550 105·300	105·405 105·425	105·415	at div. 105 10 8 46,5 12 3 15 15,5	at div. 110 10 8 59 11 50,5 15 28	by div. 105 6 29,0 3 14,5	by div. 110 6 29,0 3 14,5	• 194,500
	2089	Neg.	129·80 75·20 129·24 75·50	102·500 102·220 102·370	102·360 102·295	102·327	at div. 100 10 18 37 21 41 25 5,5	at div. 105 10 18 26 21 52,5 24 54,5	by div. 100 6 28,5 3 14,25	by div. 105 6 28,5 3 14,25	194,250
	2090	Pos.	75·50 134·80 76·10 134·30	105·150 105·450 105·200	105·300 105·325	105·312	at div. 105 10 28 15,5 31 31 34 43,5	at div. 110 10 28 26 31 20,5 34 54	by div. 105 6 28,0 3 14,0	by div. 110 6 28,0 3 14,0	194,000
	2091	Neg.	134·30 70·54 133·80 71·06	102·420 102·170 102·430	102·295 102·300	102·297	at div. 100 10 38 4 41 9 44 32	at div. 105 10 37 54 41 19 44 22	by div. 100 6 28,0 3 14,0	by div. 105 6 28,0 3 14,0	194,000
	2092	Pos.	71·06 139·20 71·70 138·78	105·130 105·450 105·240	105·290 105·345	105·317	at div. 105 10 47 42 50 57 54 10	at div. 110 10 47 51 50 48 54 19,5	by div. 105 6 28,0 3 14,00	by div. 110 6 28,5 3 14,25	194,016
	2093	Neg.	138·78 66·20 138·12 66·80	102·490 102·160 102·460	102·325 102·310	102·317	at div. 100 10 57 29,5 11 0 18 3 57,5	at div. 105 10 57 21 11 0 27 3 49	by div. 100 6 28,0 3 14,0	by div. 105 6 28,0 3 14,0	194,000
	2094	Pos.	66·80 143·48 67·52 142·98	105·140 105·500 105·250	105·320 105·375	105·347	at div. 105 11 7 8,5 10 23 13 36,5	at div. 110 11 7 16,5 10 15 13 44,5	by div. 105 6 28,0 3 14,0	by div. 110 6 28,0 3 14,0	194,000
T = 58·87 B = 29·960	2095	Neg.	142·98 62·28 142·20 63·00	102·630 102·240 102·600	102·435 102·420	102·427	at div. 100 11 16 55,5 20 2,5 23 23,5	at div. 105 11 16 47,5 20 10 23 15,5	by div. 100 6 28,0 3 14,0	by div. 105 6 28,0 3 14,0	194,000
May 4 T = 59·47 B = 29·950	2096	Pos.	91·10 119·22 91.50 119·14	105·160 105·360 105·320	105·260 105.340	105·300	at div. 105 9 46 53,5 50 10,5 53 21,5	at div. 110 9 47 15,5 49 47,5 53 44,5	by div. 105 6 28,0 3 14,0	by div. 110 6 29,0 3 14,5	194,030
	2097	Neg.	119·14 85·94 118·90 86·00	102·540 102·420 102·450	102·480 102·435	102·457	at div. 100 9 56 48,5 59 44,5 10 3 16,5	at div. 105 9 56 30 10 0 3,5 2 57,5	by div. 100 6 28,0 3 14,00	by div. 105 6 27,5 3 13,75	193,877
	2098	Pos.	86·00 124·40 86·30 124·12	105·200 105·350 105·210	105·275 105·280	105·277	at div. 105 10 6 22,5 9 39 12 51	at div. 110 10 6 39 9 22,5 13 7,5	by div. 105 6 28,5 3 14,25	by div. 110 6 28,5 3 14,25	194,250
Continued.	2099	Neg.	124·12 80·70 123·80 81·00	102·410 102·250 102·400	102·330 102·325	102·327	at div. 100 10 16 14,5 19 15,5 22 43	at div. 105 10 16 0 19 30 22 28	by div. 100 6 28,5 3 14,25	by div. 105 6 28,0 3 14,00	194,134

60th SERIES cont.—2½-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; dist. = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2100	Pos.	81·00 129·30 81·26 128·92	105·150 105·280 105·090	105·215 105·185	105·200	at div. 105 10 25 51 29 7 32 20	at div. 110 10 26 4 28 54 32 33	by div. 105 6 29,0 3 14,5	by div. 110 6 29,0 3 14,5	* 194,500
	2101	Neg.	128·92 75·76 128·60 76·00	102·340 102·180 102·300	102·260 102·240	102·250	at div. 100 10 35 41 38 45 42 9	at div. 105 10 35 29,5 38 57 42 57,5	by div. 100 6 28,0 3 14,0	by div. 105 6 28,0 3 14,0	194,000
	2102	Pos.	76·00 134·00 76·32 133·50	105·000 105·160 104·910	105·080 105·035	105·057	at div. 105 10 45 19 48 33,5 51 47	at div. 110 10 45 30 48 22,5 51 58	by div. 105 6 28,0 3 14,0	by div. 110 6 28,0 3 14,0	194,000
	2103	Neg.	133·50 70·92 133·02 71·28	102·210 101·970 102·150	102·090 102·060	102·075	at div. 100 10 55 6,5 58 12,5 11 1 34	at div. 105 10 54 56,5 58 22,5 11 1 24	by div. 100 6 27,5 3 13,75	by div. 105 6 27,5 3 13,75	193,750
	2104	Pos.	71·28 138·48 71·70 138·02	104·880 105·090 104·860	104·985 104·975	104·980	at div. 100 11 4 36,5 8 8,5 11 4	at div. 105 11 4 45,5 7 59 11 13,5	by div. 100 6 27,5 3 13,75	by div. 105 6 28,0 3 14,00	194,000
T = 59·68 B = 29·948	2105	Neg.	138·02 66·28 137·48 66·80	102·150 101·880 102·140	102·015 102·010	102·012	at div. 100 11 14 31 17 38,5 21 59	at div. 105 11 14 22,5 17 47 20 50	by div. 100 6 28,0 3 14,00	by div. 105 6 27,5 3 13,75	193,899

61st SERIES.—2-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; distance = ·367 inch.

May 5 T = 59·00 B = 29·900	2106	Pos.	90·18 111·40 90·52 111·22	100·790 100·960 100·870	100·875 100·915	100·895	at div. 100 10 21 16,5 24 15 26 54	at div. 102 10 21 27 24 4 27 4,5	by div. 100 5 37,5 2 48,75	by div. 102 5 37,5 2 48,75	168,750
	2107	Neg.	111·22 86·46 110·92 86·80	98·840 98·690 98·860	98·765 98·775	98·770	at div. 98 10 29 53 32 35 35 31	at div. 100 10 29 44,5 32 44 35 22	by div. 98 5 38,0 2 49,00	by div. 100 5 37,5 2 48,75	168,904
	2108	Pos.	86·80 114·94 87·20 114·60	100·870 101·070 100·900	100·970 100·985	100·977	at div. 100 10 38 14 41 10,5 43 51	at div. 105 10 38 33,5 40 50,5 44 11	by div. 100 5 37,0 2 48,50	by div. 105 5 37,5 2 48,75	168,549
	2109	Neg.	114·60 83·18 114·32 83·40	98·890 98·750 98·860	98·820 98·805	98·812	at div. 95 10 46 59,5 49 21 52 37	at div. 100 10 46 42 49 38,5 52 19	by div. 95 5 37,5 2 48,75	by div. 100 5 37,0 2 48,50	168,559
Continued.	2110	Pos.	83·40 118·28 83·80 118·00	100·840 101·040 100·900	100·940 100·970	100·955	at div. 100 10 55 10,5 58 5,5 11 0 48	at div. 105 10 55 26 57 49,5 11 1 4	by div. 100 5 37,5 2 48,75	by div. 105 5 38,0 2 49,00	168,798

61st SERIES cont.—2-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; dist. = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2111	Neg.	118·00 79·80 117·42 80·10	98·900 98·610 98·760	98·755 98·685	98·720	at div. 95 11 3 52 6 19 9 29,5	at div. 100 11 3 38 6 33,5 9 15	by div. 95 5 37,5 2 48,75	by div. 100 5 37,0 2 48,50	s 168,564
	2112	Pos.	80·10 121·40 80·40 121·00	100·750 100·900 100·700	100·825 100·800	100·812	at div. 100 11 12 6,5 15 0 17 43,5	at div. 105 11 12 20 14 46 17 57,5	by div. 100 5 37,0 2 48,50	by div. 105 5 37,5 2 48,75	168,541
	2113	Neg.	121·00 76·48 120·46 76·80	98·740 98·470 98·630	98·605 98·550	98·577	at div. 95 11 20 45 23 16 26 22	at div. 100 11 20 33 23 28 26 9,5	by div. 95 5 37,0 2 48,50	by div. 100 5 36,5 2 48,25	168,321
	2114	Pos.	76·80 124·30 77·30 123·92	100·550 100·800 100·610	100·675 100·705	100·690	at div. 100 11 29 1,5 31 53,5 34 38,5	at div. 105 11 29 13 31 42 34 50	by div. 100 5 37,0 2 48,5	by div. 105 5 37,0 2 48,5	168,500
T=59·20 B=29·850	2115	Neg.	123·92 73·40 123·40 73·88	98·660 98·400 98·640	98·530 98·520	98·525	at div. 95 11 37 37,5 40 10,5 43 14,5	at div. 100 11 37 26,5 40 21,5 43 3,5	by div. 95 5 37,0 2 48,5	by div. 100 5 37,0 2 48,5	168,500
May 6 T=59·20 B=29·446	2116	Pos.	88·70 112·40 88·80 112·10	100·550 100·600 100·450	100·575 100·525	100·550	at div. 100 9 44 1 46 56 49 39	at div. 102 9 44 10 46 46 49 48,5	by div. 100 5 38,0 2 49,00	by div. 102 5 38,5 2 49,25	169,069
	2117	Neg.	112·10 84·80 111·90 85·00	98·450 98·350 98·450	98·400 98·400	98·400	at div. 98 9 52 34 55 20 58 12	at div. 100 9 52 26,5 55 28 57 4	by div. 98 5 38,0 2 49,00	by div. 100 5 37,5 2 48,75	168,950
	2118	Pos.	85·00 115·92 85·32 115·80	100·460 100·620 100·560	100·540 100·590	100·565	at div. 100 10 0 59 3 52 6 37	at div. 105 10 1 17 3 34,5 6 55	by div. 100 5 38,0 2 49,0	by div. 105 5 38,0 2 49,0	169,000
	2119	Neg.	115·80 81·36 115·50 81·60	98·580 98·430 98·550	98·505 98·490	98·497	at div. 95 10 9 40,5 12 7 15 18,5	at div. 100 10 9 25 12 23 15 3	by div. 95 5 38,0 2 49,0	by div. 100 5 38,0 2 49,0	169,000
	2120	Pos.	81·60 119·50 82·00 119·20	100·550 100·750 100·600	100·650 100·675	100·662	at div. 100 10 17 56 20 49 23 34	at div. 105 10 18 10 20 34 23 48	by div. 100 5 38,0 2 49,0	by div. 105 5 38,0 2 49,0	169,000
	2121	Neg.	119·20 78·00 118·80 78·30	98·600 98·400 98·550	98·500 98·475	98·487	at div. 95 10 26 35 29 5,5 32 13	at div. 100 10 26 22 29 19 31 59,5	by div. 95 5 38,0 2 49,00	by div. 100 5 37,5 2 48,75	168,826
Continued.	2122	Pos.	78·30 122·70 78·80 122·32	100·500 100·750 100·560	100·625 100·655	100·640	at div. 100 10 34 52 37 44 40 30	at div. 105 10 35 4,5 37 32 40 42,5	by div. 100 5 38,0 2 49,0	by div. 105 5 38,0 2 49,0	169,000

61st SERIES cont.—2-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; dist. = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2123	Neg.	122·32 74·80 121·90 75·20	98·560 98·350 98·550	98·455 98·450	98·452	at div. 95 10 43 29 46 2 49 6,5	at div. 100 10 43 17,5 46 13,5 48 55	by div. 95 5 37,5 2 48,75	by div. 100 5 37,5 2 48,75	168,750
	2124	Pos.	75·20 125·80 75·62 125·32	100·500 100·710 100·470	100·605 100·590	100·597	at div. 100 10 51 47 54 38,5 57 24,5	at div. 105 10 51 58 54 28 57 35,5	by div. 100 5 37,5 2 48,75	by div. 105 5 37,5 2 48,75	168,750
T = 59·37 B = 29·438	2125	Neg.	125·32 71·84 124·88 72·28	98·580 98·360 98·580	98·470 98·470	98·470	at div. 95 11 0 23 2 58 6 0,5	at div. 100 11 0 13 3 8 5 50,5	by div. 95 5 37,5 2 48,75	by div. 100 5 37,5 2 48,75	168,750

62nd SERIES.—Brass rod *alone*, with bifilar *iron* wire; distance = ·367 inch.

May 7 T = 57·88 B = 29·300	2126	Pos.	96·40 103·28 96·60 103·20	99·840 99·940 99·900	99·890 99·920	99·905	at div. 99 9 47 5 49 1 50 22,5	at div. 100 9 47 14,5 48 51,5 50 32	by div. 99 3 17,5 1 38,75	by div. 100 3 17,5 1 38,75	98,750
	2127	Neg.	103·20 95·82 103·12 96·00	99·510 99·470 99·560	99·490 99·515	99·502	at div. 99 9 52 16 53 46 55 34	at div. 100 9 52 7 53 55 55 25	by div. 99 3 18,0 1 39,0	by div. 100 3 18,0 1 39,0	99,000
	2128	Pos.	96·00 103·92 96·20 103·82	99·960 100·060 100·010	100·010 100·035	100·022	at div. 100 9 57 9 58 48,5 10 0 26	at div. 101 9 57 17 58 40,5 10 0 34	by div. 100 3 17,0 1 38,5	by div. 101 3 17,0 1 38,5	98,500
	2129	Neg.	103·82 95·38 103·72 95·50	99·600 99·550 99·610	99·575 99·580	99·577	at div. 99 10 2 10,5 3 41 5 28	at div. 100 10 2 3 3 48,5 5 20	by div. 99 3 17,5 1 38,75	by div. 100 3 17,0 1 38,50	98,606
	2130	Pos.	95·50 104·60 95·68 104·48	100·050 100·140 100·080	100·095 100·110	100·102	at div. 100 10 7 3 8 42 10 20	at div. 101 10 7 10 8 35,5 10 27	by div. 100 3 17,0 1 38,5	by div. 101 3 17,0 1 38,5	98,500
	2131	Neg.	104·48 94·82 104·32 95·00	99·650 99·570 99·660	99·610 99·615	99·612	at div. 99 10 12 4 13 34,5 15 21,5	at div. 100 10 11 57,5 13 41 15 15	by div. 99 3 17,5 1 38,75	by div. 100 3 17,5 1 38,75	98,750
	2132	Pos.	95·00 105·12 95·28 105·00	100·060 100·200 100·140	100·130 100·170	100·150	at div. 100 10 16 56,5 18 36,5 20 13,5	at div. 101 10 17 3 18 30,5 20 20	by div. 100 3 17,0 1 38,5	by div. 101 3 17,0 1 38,5	98,500
Continued.	2133	Neg.	105·00 94·32 104·90 94·48	99·660 99·610 99·690	99·635 99·650	99·642	at div. 99 10 21 57 23 28,5 25 15	at div. 100 10 21 51 23 34,5 25 9	by div. 99 3 18,0 1 39,0	by div. 100 3 18,0 1 39,0	99,000

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean, or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2134	Pos.	94·48 105·82 94·60 105·70	100·150 100·210 100·150	100·180 100·180	100·180	at div. 100 10 26 49,5 28 30 30 6,5	at div. 102 10 27 1 28 28,5 30 18,5	by div. 100 3 17,0 1 38,50	by div. 102 3 17,5 1 38,75	98,522
	2135	Neg.	105·70 93·80 105·50 94·00	99·750 99·650 99·750	99·700 99·700	99·700	at div. 98 10 32 56,5 33 17 35 14	at div. 100 10 32 46 33 28 35 3	by div. 98 3 17,5 1 38,75	by div. 100 3 17,0 1 38,50	98,537
	2136	Pos.	94·00 106·30 94·20 106·18	100·150 100·250 100·200	100·200 100·225	100·215	at div. 100 10 36 43 38 24 40 0	at div. 102 10 36 53,5 38 13 40 11	by div. 100 3 17,0 1 38,50	by div. 102 3 17,5 1 38,75	98,527
	2137	Neg.	106·18 93·42 105·94 93·60	99·800 99·680 99·770	99·740 99·725	99·732	at div. 98 10 41 49 43 10 45 6	at div. 100 10 41 39 43 20 44 56	by div. 98 3 17,0 1 38,5	by div. 100 3 17,0 1 38,5	98,500
	2138	Pos.	93·60 106·72 93·72 106·52	100·160 100·220 100·120	100·190 100·170	100·180	at div. 100 10 46 36 48 16,5 49 53	at div. 102 10 46 46 48 65 50 3	by div. 100 3 17,0 1 38,5	by div. 102 3 17,0 1 38,5	98,500
T=57·90 B=29·266	2139	Neg.	106·52 93·00 106·36 93·20	99·760 99·680 99·780	99·720 99·730	99·725	at div. 98 10 51 41,5 53 4 54 59	at div. 100 10 51 32 53 13 54 49,5	by div. 98 3 17,5 1 38,75	by div. 100 3 17,5 1 38,75	98,750
May 8 T=57·15 B=29·438	2140	Pos.	97·18 103·46 97·32 103·32	100·320 100·390 100·320	100·355 100·355	100·355	at div. 100 9 59 42 10 1 27 3 0	at div. 101 9 59 52 10 1 17 3 10	by div. 100 3 18,0 1 39,0	by div. 101 3 18,0 1 39,0	99,000
	2141	Neg.	103·32 96·48 103·22 96·54	99·900 99·850 99·880	99·875 99·865	99·870	at div. 99 10 4 51 6 14 8 8,5	at div. 100 10 4 42 6 23 7 59	by div. 99 3 17,5 1 38,75	by div. 100 3 17,0 1 38,50	98,532
	2142	Pos.	96·54 104·00 96·70 103·90	100·270 100·350 100·300	100·310 100·325	100·317	at div. 100 10 9 38 11 22 12 55,5	at div. 101 10 9 46 11 13,5 13 4	by div. 100 3 17,5 1 38,75	by div. 101 3 18,0 1 39,00	98,829
	2143	Neg.	103·90 95·80 103·80 95·88	99·850 99·800 99·840	99·825 99·820	99·822	at div. 99 10 14 44,5 16 10 18 1,5	at div. 100 10 14 36,5 16 18 17 53,5	by div. 99 3 17,0 1 38,5	by div. 100 3 17,0 1 38,5	98,500
	2144	Pos.	95·88 104·70 96·00 104·50	100·290 100·350 100·250	100·320 100·300	100·310	at div. 100 10 19 33 21 16 22 50,5	at div. 101 10 19 40,5 21 8,5 22 58	by div. 100 3 17,5 1 38,75	by div. 101 3 17,5 1 38,75	98,750
Continued.	2145	Neg.	104·50 95·20 104·32 95·30	99·850 99·760 97·810	99·805 99·785	99·795	at div. 99 10 24 37,5 26 5 27 54,5	at div. 100 10 24 31 26 12 27 48	by div. 99 3 17,0 1 38,5	by div. 100 3 17,0 1 38,5	98,500

62nd SERIES continued.—Brass rod *alone*, with bifilar *iron* wire; distance = ·367 inch.

1842.	No.	Position of the Masses.	Extreme Divisions observed.	1st Mean.	2nd Mean.	3rd Mean or Resting Point.	Observed Times.		2 N		N for Mean Resting Point.
							h m s	h m s	m s	m s	
Continued.	2146	Pos.	95·30 105·12 95·40 105·00	100·210 100·260 100·200	100·235 100·230	100·232	at div. 100 10 29 27,5 31 10 32 44,5	at div. 101 10 29 34 31 3 32 51	by div. 100 3 17,0 1 38,5	by div. 101 3 17,0 1 38,5	* 98,500
	2147	Neg.	105·00 94·60 104·88 94·72	99·800 99·740 99·800	99·770 99·770	99·770	at div. 99 10 34 30,5 36 0 37 48	at div. 100 10 34 24,5 36 6 37 41,5	by div. 99 3 17,5 1 38,75	by div. 100 3 17,0 1 38,50	98,558
	2148	Pos.	94·72 105·80 94·90 105·72	100·260 100·350 100·310	100·305 100·330	100·317	at div. 100 10 39 21 41 2,5 42 38	at div. 101 10 39 27 40 57 42 44	by div. 100 3 17,0 1 38,5	by div. 101 3 17,0 1 38,5	98,500
	2149	Neg.	105·72 94·12 105·60 94·32	99·920 99·860 99·960	99·890 99·910	99·900	at div. 99 10 44 23,5 45 52,5 47 41	at div. 100 10 44 18 45 58 47 35,5	by div. 99 3 17,5 1 38,75	by div. 100 3 17,5 1 38,75	98,750
	2150	Pos.	94·32 106·36 94·48 106·30	100·340 100·420 100·390	100·380 100·405	100·392	at div. 100 10 49 14 50 56,5 52 31	at div. 101 10 49 19 50 51 52 36,5	by div. 100 3 17,0 1 38,50	by div. 101 3 17,5 1 38,75	98,598
	2151	Neg.	106·30 93·60 106·18 93·90	99·950 99·890 100·040	99·920 99·965	99·942	at div. 99 10 54 17 55 47 57 35	at div. 100 10 54 12 55 52 57 30	by div. 99 3 18,0 1 39,0	by div. 100 3 18,0 1 39,0	99,000
	2152	Pos.	93·90 107·00 94·20 106·82	100·450 100·600 100·510	100·525 100·555	100·540	at div. 100 10 59 6,5 11 0 51 2 24	at div. 101 10 59 11,5 11 0 46 2 19,5	by div. 100 3 17,5 1 38,75	by div. 101 3 18,0 1 39,00	98,885
T = 57·25 B = 29·460	2153	Neg.	106·82 93·42 106·70 93·70	100·120 100·060 100·200	100·090 100·130	100·110	at div. 100 11 4 7 5 45 7 24,5	at div. 101 11 4 2,5 5 49,5 7 20	by div. 100 3 17,5 1 38,75	by div. 101 3 17,5 1 38,75	98,750

TABLE II.

The *first* column contains the date of the observations, in the order in which they have been made.

The *second* column indicates the ordinal number of the experiment to which it is affixed.

The *third* column denotes the position of the masses, or the side of the torsion box on which they are placed and continue, during the period of the experiment. The sign + denotes the positive side, and the sign — denotes the negative side. These three columns are similar to those in Table I.

The *fourth* column expresses the number of seconds of time occupied by the torsion rod in making one vibration, the middle of which is assumed to be the resting point placed opposite thereto in the next collateral column; and it is the same as the last column in Table I.

The *fifth* column contains the mean resting point alluded to in the preceding paragraph; and is the same as the seventh column in Table I. When an asterisk occurs in this column, it indicates that the arc of vibration, to which it is annexed, has *in*creased.

The *sixth* column represents the mean distance of the centre of the masses from the centre of the balls, when in their positive and negative positions respectively, expressed in inches.

These last mentioned three columns contain the values that have been actually *observed*; but the next three columns contain the values that have been *deduced* from these observations, and which are employed in the computation of the results.

The *seventh* column denotes the time (= N) deduced agreeably to the method explained in page 52. When an asterisk occurs in this and the next column, it indicates that Cavendish's method has been employed in the reduction. See page 54.

The *eighth* column denotes the deviation (= D) of the torsion rod from its zero position; deduced, also, agreeably to the method explained in page 52.

The *ninth* column is merely the mean of the values in the sixth column. See the note in page 54.

The *tenth* column contains the *single* results of the experiments, combined by threes, in the manner explained in page 52.

The *eleventh* and last column is the mean value of the single results, in the preceding column, in each day; and which is, therefore, denominated the *daily* results.

At the *end* of each series is given the *mean result* of all the single results, together with its *probable error*. There is also annexed the logarithm of the *constant* (C).

For further remarks see page 53.

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TABLE II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.

1st SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Jan. 24	1	+	465·450	111·450	10·9911					5·9053
	2	−	470·796	94·012	11·0098	469·019	8·412	11·0005	5·9951	
	3	+	469·034	110·225		469·863	8·703		5·8155	
	4	−	470·588	91·625						
25	5	+	451·140	108·912	10·9993					5·7431
	6	−	460·078	93·437	11·0032	455·650	8·294	11·0013	5·7379	
	7	+	451·307	111·137		454·411	8·234		5·7483	
	8	−	454·955	95·900						
27	9	+	504·800	116·800	10·9934					5·7355
	10	−	504·480	96·487	11·0010	504·250	10·116	10·9972	5·7659	
	11	+	503·241	116·637		503·427	10·128		5·7402	
	12	−	502·745	96·275		502·628	10·124		5·7243	
	13	+	501·782	116·412		501·849	10·115		5·7116	
	14	−	501·087	96·087						
28	15	+	445·106	114·212	10·9920					5·6250
	16	−	444·371	97·512	11·0013	444·256	8·143	10·9966	5·5604	
	17	+	443·177	113·387		444·602	8·040		5·6404	
	18	−	447·685	97·100		445·686	8·046		5·6637	
	19	+	444·200	113·000		446·592	8·119		5·6356	
	20	−	450·286	96·425						
29	21	+	451·900	115·400	10·9906					5·7770
	22	−	452·470	98·400	11·0027	451·065	8·071	10·9967	5·7832	
	23	+	447·422	113·687		449·195	7·962		5·8139	
	24	−	449·469	97·125		448·269	8·040		5·7337	
	25	+	446·719	113·125						
30	26	−	472·800	93·700	10·9910					5·5390
	27	+	474·670	111·150	10·9910	475·650	9·975	10·9910	5·2088	
	28	−	480·460	88·700		484·078	10·593		5·0802	
	29	+	500·725	108·625		495·637	9·469		5·9579	
	30	−	500·649	90·675		500·883	9·750		5·9093	
	31	+	501·509	111·725						
Feb. 1	32	−	453·931	95·862*	10·9953					5·6109
	33	+	462·090	113·350	10·9940	459·899	8·741	10·9946	5·5532	
	34	−	461·488	95·875		459·312	8·756		5·5296	
	35	+	452·185	113·425		455·754	8·394		5·6790	
	36	−	456·760	97·400		453·034	8·290		5·6818	
	37	+	446·431	114·537						

Mean result = 5·6813

log. C = 6·3603556

Probable error = ·0284

2nd SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Feb. 2	38	+	465·095	111·937	10·9962					5·3557
	39	−	453·231	94·462	10·9940	458·401	9·115	10·9951	5·2903	
	40	+	462·050	113·450		457·579	8·863		5·4212	
	41	−	452·987	96·987						

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Feb. 3	42	−	470·748	95·437*	missed.					5·7557
	43	+	445·947	110·737		457·450	8·228	10·9951	5·8363	
	44	−	467·156	93·125		457·112	8·449		5·6752	
	45	+	448·188	109·312						
5	46	−	452·275	97·850	10·9984					5·2886
	47	+	458·913	114·587	10·9986	460·139	8·853	10·9985	5·4848	
	48	−	470·456	95·912*		465·596	8·837		5·6258	
	49	+	462·560	112·587		465·769	9·609		5·1777	
	50	−	467·500	90·825		482·826	10·987		4·8660	
	51	+	533·744	113·012*						
6	52	+	476·850	116·100	10·9988					5·8715
	53	−	484·837	97·837	10·9960	479·762	9·094	10·9974	5·8057	
	54	+	472·525	115·950		482·140	9·491		5·6182	
	55	−	498·675	96·100		493·140	9·765		5·7125	
	56	+	502·688	115·312		494·868	8·847		6·3496	
	57	−	475·421	99·137*						
8	58	+	458·500	115·000*	10·9986					
	59	−	493·400	95·400	10·9968	493·300	9·806	10·9977	5·6920	5·6920
	60	+	527·900	115·050*						

Mean result = 5·5818

log. C = 6·3603556

Probable error = ·0644

3rd SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·177 inch.

Feb. 20	61	+	473·403	109·537	11·0008					5·7065
	62	−	488·763	90·475	10·9960	488·176	9·990	10·9984	5·4710	
	63	+	501·775	111·375		499·058	9·844		5·8024	
	64	−	503·920	92·900		502·807	9·918		5·8460	
	65	+	501.615	114·100						
21	66	+	......	108·950	10·9992					5·6586
	67	−	452·575	90·850	10·9946	457·556	8·734	10·9969	5·4989	
	68	+	462·537	107·687		462·966	8·543		5·7563	
	69	−	474·215	90 350		474·223	9·543		5·4061	
	70	+	485·928	111·187		484·985	9·556		5·6465	
	71	−	493·870	93·800		492·018	9·409		5·9023	
	72	+	494·405	114·050		494·916	9·787		5·7413	
	73	−	496·985	95·150						
22	74	+	......	117·800	10·9980					5·6269
	75	−	456·807	100·387	10·9923	456·995	8·190	10·9952	5·8516	
	76	+	457·184	115·737		456·000	8·578		5·5626	
	77	−	452·823	96·775		453·973	8·356		5·6597	
	78	+	453·062	111·237		452·260	8·147		5·7612	
	79	−	450·094	93·112		451·595	8·456		5·5344	
	80	+	453·131	108·812		452·820	8·259		5·6972	
	81	−	454·926	91·475		456·686	8·993		5·3219	
	82	+	463·762	110·112						
	83	+	......	109·050		482·132*	9·087		5·8701	5·8701
	84	−	481·425	90·750						

TABLE II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Feb. 23	85	−	……	92·450	10·9931					
	86	+	452·002	109·050	10·9975	452·318	8·297	10·9953	5·6584	5·6457
	87	−	452·635	92·462		451·907	8·294		5·6502	
	88	+	450·357	109·050		451·400	8·288		5·6416	
	89	−	452·253	92·487		452·068	8·369		5·6035	
	90	+	453·410	109·400		454·565	8·300		5·7127	
	91	−	459·189	93·112		460·610	8·681		5·6082	
	92	+	470·655	111·550						
24	93	+	……	113·550	10·9992					
	94	−	458·585	96·662	10·9920	458·953	8·378	10·9956	5·7690	5·7259
	95	+	459·322	113·287		458·356	8·662		5·5653	
	96	−	456·198	95·262		456·560	8·247		5·7997	
	97	+	454·522	110·225		453·907	8·194		5·7695	
	98	−	450·388	92·412						
	99	−	……	92·775						
	100	+	450·322	109·287		453·712*	8·225*		5·7429	5·7429
25	101	+	……	110·400	11·0000			10·9963		
	102	−	445·850	94·300	10·9926	444·756	8·112		5·5945	5·5583
	103	+	443·662	110·650		445·386	8·153		5·5822	
	104	−	448·373	94·387						
	105	−	……	92·050						
	106	+	462·899	108·987		470·670	8·884		5·7172	5·5960
	107	−	478·442	90·387		478·074	9·578		5·4748	
	108	+	492·515	110·100						
	109	+	480·425	116·350						
	110	−	487·522	95·912		487·270*	10·050*		5·4201	5·4201
26	111	−	……	89·500	10·9936					
	112	+	480·325	108·650	11·0008	486·736	9·912	10·9972	5·4828	5·6946
	113	−	493·148	88·150		493·258	10·165		5·4906	
	114	+	506·412	108·312		502·242	9·612		6·0199	
	115	−	502·998	90·025		503·970	10·071		5·7851	
	116	+	503·475	112·025						
	117	−	514·257	93·487	10·9936					
	118	+	509·856	115·425	10·9992	510·928	10·334	10·9964	5·7955	5·7892
	119	−	509·744	96·025		508·531	10·259		5·7832	
	120	+	504·782	117·662						
	121	+	……	121·000						
	122	−	508·430	100·350		508·758*	10·287*		5·7726	5·7726
27	123	−	……	93·850	10·9938					
	124	+	447·562	110·250	10·9992	449·932	8·269	10·9960	5·6177	5·6461
	125	−	452·303	93·575		450·284	8·203		5·6714	
	126	+	448·971	109·712		449·776	8·256		5·6210	
	127	−	448·859	92·825		448·716	8·140		5·6742	
	128	+	448·175	108·500						
28	129	+	……	120·500	11·0008					
	130	−	454·300	103·400	10·9928	455·314	8·503	10·9968	5·5932	5·6288
	131	+	456·328	120·312		455·523	8·540		5·5741	
	132	−	455·138	103·062		455·555	8·328		5·7168	
	133	+	455·619	119·125		454·995	8·434		5·6310	
	134	−	453·605	101·450						

Mean result = 5·6640

log. C = 6·3603556

Probable error = ·0136

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
4th SERIES.—2 inch *Zinc* balls, with bifilar *silk* lines; distance = ·177 inch.										
March 1	135	+	449·475	117·650	11·0005					
	136	−	456·650	101·700	10·9937	454·055	7·809	10·9971	6·0266	5·9525
	137	+	453·445	116·987		456·011	8·075		5·8784	
	138	−	460·505	99·975						
2	139	+	......	114·000	11·0008					
	140	−	421·880	99·493	10·9914	422·202	7·103	10·9961	5·7297	5·7999
	141	+	422·525	113·400		421·795	7·464		5·4421	
	142	−	420·250	97·450		422·760	7·142		5·7135	
	143	+	428·014	110·068		428·074	6·632		6·3085	
	144	−	436·019	96·156		437·634	8·485		5·1535	
	145	+	450·487	116·187		451·271	7·608		6·1113	
	146	−	468·093	105·787		464·881	7·506		6·5736	
	147	+	472·853	125·412		474·488	9·578		5·3667	
	148	−	484·155	106·725						
3	149	+	487·502	121·668	10·9999					
	150	−	499·883	104·187	10·9913	494·117	9·361	10·9956	5·9551	5·9028
	151	+	489·202	124·150		492·654	9·608		5·7680	
	152	−	492·330	105·681		491·093	9·209		5·9798	
	153	+	490·512	124·050		492·469	9·373		5·9081	
	154	−	496·523	104·925						
4	155	+	420·850	116·900	10·9999					
	156	−	428·744	102.512	10·9919	423·813	7·134	10·9959	5·7486	5·6276
	157	+	416·915	116·662		420·272	7·470		5·3987	
	158	−	418·517	100·932		418·373	7·063		5·6583	
	159	+	419·346	113·457		418·152	6·998		5·7048	
	160	−	419·402	97·990						
	161	+	473·872	119·372	11·0003					
	162	−	486·178	102·645	10·9915	481·540	9·089	10·9959	5·8250	5·8823
	163	+	479·932	122·275		483·387	8·982		5·9397	
	164	−	487·506	105·975						
5	165	+	435·762	116·010	10·9992					
	166	−	428·203	99·595	10·9928	431·525	7·550	10·9960	5·6312	5·5423
	167	+	433·933	113·380		435·695	7·177		6·0390	
	168	−	446·714	98·455		446·456	9·073		5·0159	
	169	+	458·465	119·825		459·761	8·802		5·4830	
	170	−	475·401	105·987						
6	171	−	454·517	89·967	10·9921					
	172	+	467·000	104·975*	10·9989	466·031	7·794	10·9955	6·3628	5·9549
	173	−	475·608	88·806		475·971	9·261		5·5857	
	174	+	485·670	109·681		484·317	9·290		5·7653	
	175	−	490·321	93·397		490·308	8·990		6·1060	
	176	+	494·922	113·075						
7	177	−	503·320	89·787	10·9925	511·365*	10·587*	10·9940	5·6414	5·6414
	178	+	......	110·750	10·9955					
	179	−	493·622	95·757						
	180	+	495·376	114·170		494·467	9·571		5·8346	5·8129
	181	−	493·496	94·297		493·809	9·617		5·7913	
	182	+	492·868	112·895						

TABLE II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
March 8	183	+	……	122·820	10·9936					
	184	−	500·927	100·917	10·9943	503·559	9·874	10·9939	5·8656	
	185	+	506·192	118·512		503·884	9·544		6·0763	5·9217
	186	−	502·225	97·930		501·098*	9·849		5·8231	
	187	+	……	116·745						
	188	+	……	117·070		496·731*	9·947*		5·6657	5·6657
	189	−	494·645	96·900						
9	190	−	……	92·200	10·9952					
	191	+	427·565	106·087	10·9212	427·075	7·384	10·9932	5·6425	
	192	−	426·586	90·437		426·902	7·447		5·5903	
	193	+	426·872	104·575		427·256	7·421		5·6192	
	194	−	428·695	89·027		428·938	7·557		5·5616	5·5577
	195	+	431·492	103·710		432·357	7·411		5·7619	
	196	−	437·750	88·750		437·603	8·505		5·1434	
	197	+	443·422	107·812		445·671	8·122		5·5863	
	198	−	458·092	94·385						
	199	−	498·475	90·050						
	200	+	496·434	110·525		496·971	9·792		5·7617	5·7617
	201	−	496·543	91·830						
10	202	−	……	92·000	10·9937					
	203	+	421·325	104·767	10·9905	420·941	7·037	10·9921	5·7531	
	204	−	420·558	89·385		420·375	7·176		5·6265	
	205	+	419·062	102·707		419·732	7·131		5·6447	
	206	−	420·249	87·505		419·765	7·174		5·6117	
	207	+	419·500	101·000		420·380	7·090		5·6949	5·6702
	208	−	422·273	86·135		422·763	7·505		5·4411	
	209	+	427·008	101·292		429·918	6·781		6·2277	
	210	−	443·385	89·325		440·188	8·536		5·1864	
	211	+	446·975	111·502		450·764	9·208		5·0417	
	212	−	465·723	96·847		465·025	7·632		6·4740	
	213	+	481·680	112·722						
11	214	+	……	113·350	10·9908					
	215	−	433·453	98·547	10·9928	427·990	7·375	10·9918	5·6764	
	216	+	422·528	113·245		425·769	7·644		5·4187	
	217	−	424·568	97·365		423·536	7·115		5·7607	
	218	+	422·481	109·945		422·950	7·253		5·6355	5·6733
	219	−	422·271	93·512		422·143	7·061		5·7667	
	220	+	421·549	105·325		420·811	6·998		5·7819	
	221	−	417·878	89·145						
12	222	−	……	93·720	10·9936					
	223	+	422·356	106·285	10·9912	422·113	7·169	10·9924	5·6783	
	224	−	421·871	90·172		421·069	7·437		5·4467	
	225	+	418·179	103·810		422·024	7·249		5·6133	
	226	−	429·870	88·450		424·044	7·050		5·8272	5·6827
	227	+	418·158	101·292		420·580	7·177		5·6309	
	228	−	415·936	85·425		418·904	7·280		5·5071	
	229	+	425·486	98·680		426·435	6·840		6·0754	
	230	−	438·835	84·577						
14	231	+	412·842	106·895	10·9912					
	232	−	423·128	92·122	10·9940	419·131	7·252	10·9926	5·5341	
	233	+	417·428	106·357		419·351	7·414		5·4189	5·5674
	234	−	419·422	90·937		418·660	6·992		5·7270	
	235	+	418·371	103·485		418·136	7·146		5·5896	
	236	−	416·383	87·447						

Mean result = 5·7191

log. C = 6·3582236

Probable error = ·0241

5th SERIES.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·177 inch.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
March 15	237	+	363·092	103·312	10·9903					
	238	−	355·200	93·067	10·9915	358·481	4·940	10·9909	5·8426	5·7111
	239	+	360·435	102·580		357·357	5·204		5·5115	
	240	−	353·361	91·277		356·689	4·806		5·9456	
	241	+	359·600	99·200		357·336	5·172		5·5449	
	242	−	356·783	86·435						
16	243	+	370·754	106·787	10·9896					
	244	−	351·420	95·080	10·9924	358·754	5·048	10·9910	5·7262	5·7327
	245	+	361·424	103·565		358·273	5·042		5·7177	
	246	−	358·824	91·882		361·342	5·098		5·7521	
	247	+	366·296	100·592		364·464	5·202		5·7350	
	248	−	366·443	88·492						
17	249	+	464·524	109·262	10·9892					
	250	−	481·923	92·662	10·9932	476·470	8·550	10·9912	5·9632	6·1006
	251	+	477·512	110·262		477·127	8·340		6·1303	
	252	−	471·563	94·500		473·389	8·209		6·1309	
	253	+	472·919	111·577		474·543	8·186		6·1781	
	254	−	480·772	95·910						
	255	−	......	92·425	10·9928					
	256	+	465·764	110·132	10·9898	471·821	8·085	10·9913	6·1836	6·0844
	257	−	477·879	95·497		472·761	8·181		6·1354	
	258	+	469·525	113·587		473·146	8·458		5·9442	
	259	−	475·655	97·845		473·006	8·272		6·0742	
	260	+	471·192	115·192						
18	261	+	368·592	106·837	10·9892					
	262	−	359·666	95·112	10·9918	363·637	5·215	10·9905	5·6953	5·4691
	263	+	366·625	104·250		364·802	5·368		5·5684	
	264	−	366·292	91·917		368·326	5·902		5·1630	
	265	+	374·097	103·195		381·356	5·994		5·4497	
	266	−	410·941	90·495						
19	267	+	374·748	107·687	10·9888					
	268	−	369·990	96·340	10·9920	370·697	5·829	10·9904	5·2952	5·5169
	269	+	368·060	108·310		368·741	5·688		5·3694	
	270	−	368·856	97·527		369·462	5·245		5·8456	
	271	+	372·078	107·725		371·360	5·574		5·5573	
	272	−	372·391	95·625						
	273	+	445·925	115·950	10·9888					
	274	−	471·563	98·937	10·9932	466·016	8·022	10·9910	6·0801	6·0801
	275	+	475·013	114·012						
20	276	+	358·026	109·737	10·9905					
	277	−	349·758	98·742	10·9932	354·114	4·896	10·9918	5·7514	5·7775
	278	+	358·916	107·332		356·896	5·145		5·5593	
	279	−	359·994	95·342		363·287	5·243		5·6526	
	280	+	374·245	104·327		374·943	5·136		6·1466	
	281	−	391·286	92·767						
	282	+	457·787	100·032		444·073*	7·397*		5·9866	5·9866
	283	−	460·747	85·655						
	284	+	473·095	111·730						
	285	−	479·979	96·617		475·087	8·385		6·0447	5·9668
	286	+	467·297	115·045		470·850	8·454		5·8889	
	287	−	468·826	99·657						

Mean result = 5·7990

log. C = 6·3506819

Probable error = ·0327

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
6th SERIES.—$1\frac{1}{2}$-inch *Platina* balls, with bifilar *silk* lines; distance = ·177 inch.										
March 24	288	+	471·456	106·912	10·9891					
	289	−	467·094	87·812	10·9951	475·937	9·677	10·9921	5·3071	
	290	+	498·105	107·420		492·456	8·969		6·1304	5·6916
	291	−	506·520	91·152		503·090	9·985		5·7470	
	292	+	501·215	114·825		504·253	10·328		5·5818	
	293	−	508·063	97·187						
25	294	+	439·732	112·930	10·9904					
	295	−	444·797	97·407	11·0027	442·899	7·300	10·9965	6·0872	
	296	+	442·270	111·082		442·016	7·817		5·6622	5·8296
	297	−	438·727	93·487		439·891	7·843		5·5893	
	298	+	439·840	107·265		440·101	7·338		5·9796	
	299	−	441·997	91·690						
26	300	+	440·516	111·032	10·9906					
	301	−	439·838	94·647	11·0042	441·465	7·603	10·9974	5·8061	5·6945
	302	+	445·668	108·675		444·503	8·016		5·5830	
	303	−	446·841	90·637						
	304	+	466·313	110·422						
	305	−	485·111	96·387		480·678	8·876		5·8961	
	306	+	486·177	117·857		487·954	10·090		5·3449	5·6538
	307	−	494·353	98·967		489·921	9·487		5·7306	
	308	+	484·802	118·025		489·273	9·608		5·6435	
	309	−	493·135	98·650						
27	310	+	452·027	109·027	10·9937					
	311	−	447·353	91·295	11·0063	448·255	8·938	11·0000	5·0896	
	312	+	446·289	109·317		455·753	8·224		5·7181	5·4586
	313	−	483·084	94·443		474·217	9·127		5·5782	
	314	+	484·412	116·077		486·727	9·844		5·4484	
	315	−	495·000	98·335						
28	316	+	452·575	117·075	10·9907					
	317	−	460·163	101·175	11·0058	457·098	8·170	10·9982	5·7918	
	318	+	455·489	117·955		456·746	8·421		5·6105	
	319	−	455·842	101·052		455·033	8·060		5·8179	
	320	+	452·959	116·392		453·387	8·030		5·7974	5·7362
	321	−	451·789	99·612		451·123	7·823		5·8916	
	322	+	447·956	114·125		449·910	8·112		5·6511	
	323	−	451·941	96·187		454·355	8·359		5·5931	
	324	+	465·584	111·687						
30	325	−	452·818	95·182	11·0060					
	326	+	453·330	111·660	10·9905	453·711	8·268	10·9983	5·6385	
	327	−	455·367	95·065		454·511	8·266		5·6598	5·6544
	328	+	453·980	111·535		453·337	8·311		5·6001	
	329	−	452·024	94·760		453·897	8·158		5·7192	
	330	+	457·562	110·620						

Mean result = 5·6791

log. C = 6·3548718

Probable error = ·0269

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
7th Series.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.										
March 31	331	−	212·698	96·302	10·9963					5·6731
	332	+	212·500	99·972	10·9914	212·592	1·830	10·9938	5·6688	
	333	−	212·670	96·322		212·767	1·807		5·7504	
	334	+	213·230	99·922		213·407	1·830		5·7124	
	335	−	214·500	96·200		212·557	1·834		5·6545	
	336	+	208·000	99·815		210·812	1·836		5·5560	
	337	−	212·750	96·087		211·750	1·855		5·5481	
	338	+	213·500	99·780		213·437	1·828		5·7202	
	339	−	214·000	96·162		213·875	1·872		5·6087	
	340	+	214·000	100·035		214·106	1·829		5·7529	
	341	−	214·426	96·592		214·338	1·831		5·7591	
	342	+	214·500	100·475						
April 1	343	+	212·087	99·725	10·9919					5·6755
	344	−	212·473	96·055	10·9963	212·258	1·855	10·9941	5·5745	
	345	+	212·000	99·807		212·243	1·840		5·6192	
	346	−	212·500	96·197		212·433	1·820		5·6912	
	347	+	212·734	99·870		212·673	1·835		5·6573	
	348	−	212·725	96·202		212·921	1·848		5·6306	
	349	+	213·500	99·927		213·103	1·847		5·6433	
	350	−	212·687	96·265		212·900	1·796		5·7925	
	351	+	212·729	99·787		212·661	1·810		5·7348	
	352	−	212·500	96·070		212·615	1·830		5·6697	
	353	+	212·734	99·672		212·679	1·808		5·7421	
	354	−	212·750	96·042						
2	355	−	212·050	96·950	10·9982					5·6784
	356	+	212·907	100·630	10·9922	212·716	1·887	10·9952	5·5025	
	357	−	213·000	96·762		212·895	1·864		5·5798	
	358	+	212·675	100·350		212·814	1·803		5·7642	
	359	−	212·909	96·727		212·998	1·785		5·8324	
	360	+	213·500	100·247		213·189	1·817		5·7400	
	361	−	212·850	96·500		213·113	1·831		5·6920	
	362	+	213·254	100·077		213·152	1·815		5·7443	
	363	−	213·250	96·392		213·314	1·845		5·6595	
	364	+	213·504	100·087		213·689	1·793		5·8441	
	365	−	214·500	96·610		214·258	1·871		5·6303	
	366	+	214·531	100·620		214·616	1·916		5·5165	
	367	−	214·902	96·965		214·905	1·855		5·7133	
	368	+	215·286	100·730		215·219	1·896		5·6060	
	369	−	215·404	96·912		215·398	1·874		5·6813	
	370	+	215·500	100·590		215·476	1·861		5·7251	
	371	−	215·500	96·822		215·507	1·884		5·6569	
	372	+	215·530	100·592		215·555	1·890		5·6414	
	373	−	215·660	96·800		215·594	1·888		5·6494	
	374	+	215·528	100·562		215·594	1·874		5·6916	
	375	−	215·659	96·827		215·656	1·873		5·6980	
	376	+	215·779	100·585						
3	377	−	212·528	96·945	10·9984					5·6942
	378	+	211·750	100·630	10·9932	211·886	1·837	10·9958	5·6077	
	379	−	211·517	96·967		211·670	1·820		5·6485	
	380	+	211·897	100·587		211·800	1·829		5·6276	
Continued.	381	−	211·889	96·892		211·981	1·810		5·6964	

Table II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
Continued.	382	+	212·250	100·437		212·074	1·792		5·7587	5·6942
	383	−	211·909	96·812		212·146	1·790		5·7690	
	384	+	212·517	100·350		212·173	1·864		5·5414	
	385	−	211·750	96·432		212·127	1·824		5·6605	
	386	+	212·491	99·812		212·245	1·812		5·7043	
	387	−	212·250	95·942		212·497	1·831		5·6585	
	388	+	213·000	99·397		213·161	1·697		6·1434	
	389	−	214·394	96·065		214·074	1·870		5·6231	
	390	+	214·511	100·215		214·582	1·906		5·5431	
	391	−	214·913	96·740		214·896	1·791		5·9163	
	392	+	215·250	100·430		215·209	1·894		5·6108	
	393	−	215·423	96·542		215·402	1·902		5·5973	
	594	+	215·513	100·262						

Mean result = 5·6814

log. C = 6·3603556

Probable error = ·0108

8th Series.—2½-inch *Lead* balls, with bifilar *silk* lines; distance =·415 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
April 4	395	+	221·750	101·515	10·9928					5·6531
	396	−	222·000	97·472	10·9956	222·062	2·014	10·9942	5·6569	
	397	+	222·500	101·487		222·125	2·029		5·6182	
	398	−	221·500	97·387		221·875	2·000		5·6869	
	399	+	222·000	101·290		221·750	2·004		5·6691	
	400	−	221·500	97·175		221·625	2·004		5·6627	
	401	+	221·500	101·077		221·538	2·004		5·6583	
	402	−	221·652	96·962		221·652	2·057		5·5182	
	403	+	221·804	101·075		221·940	1·993		5·7102	
	404	−	222·500	97·217		222·201	1·994		5·7208	
	405	+	222·000	101·335		222·125	2·025		5·6293	
	406	−	222·000	97·352						
5	407	+	222·000	101·317	10·9938					5·6234
	408	−	221·947	97·212	10·9964	221·990	2·038	10·9951	5·5857	
	409	+	222·065	101·260		222·010	2·041		5·5785	
	410	−	221·965	97·142		221·998	2·031		5·6054	
	411	+	222·000	101·150		221·928	2·018		5·6379	
	412	−	221·750	97·087		221·875	2·042		5·5690	
	413	+	222·000	101·192		222·000	2·001		5·6895	
	414	−	222·250	97·292		222·080	2·007		5·6766	
	415	+	221·821	101·422		222·035	2·018		5·6434	
	416	−	222·250	97·480		222·163	2·028		5·6223	
	417	+	222·333	101·652		222·229	2·028		5·6254	
	418	−	222·000	97·712						
6	419	+	221·837	101·675	10·9945					5·5707
	420	−	221·500	97·605	10·9955	221·584	2·042	10·9950	5·5545	
	421	+	221·500	101·705		221·625	2·049		5·5376	
	422	−	222·000	97·607		221·864	2·039		5·5767	
	423	+	221·958	101·667		221·916	2·025		5·6141	
	424	−	221·750	97·625						
	425	−	223·000	97·522	10·9982					5·6322
	426	+	222·500	101·720	10·9934	222·715	2·029	10·9958	5·6465	
	427	−	222·860	97·800		222·704	2·026		5·6543	
	428	+	222·599	101·987		222·727	2·047		5·5975	
Continued.	429	−	222·851	97·987		222·727	2·042		5·6111	

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
Continued.	430	+	222·608	102·155		222·704	2·049		5·5908	5·6322
	431	−	222·750	98·125		222·652	2·042		5·6074	
	432	+	222·500	102·265		222·646	2·036		5·6236	
	433	−	222·837	98·260		222·760	2·027		5·6544	
	434	+	222·868	102·365		222·852	2·051		5·5928	
	435	−	222·837	98·267		222·853	2·064		5·5576	
	436	+	222·871	102·427		222·852	2·055		5·5819	
	437	−	222·831	98·367		222·820	2·008		5·7109	
	438	+	222·750	102·340		222·770	1·991		5·7571	
	439	−	222·750	98·350		222·750	2·023		5·6650	
	440	+	222·750	102·452						
April 7	441	+	221·000	101·525	missed.					5·6710
	442	−	222·000	97·445		221·812	2·040	10·9958	5·5706	
	443	+	222·250	101·525		222·542	1·985		5·7627	
	444	−	223·668	97·665		222·897	2·001		5·7349	
	445	+	222·000	101·812		222·604	2·010		5·6942	
	446	−	222·750	97·920		222·526	2·024		5·6508	
	447	+	222·606	102·125		222·763	2·042		5·6130	
	448	−	223·092	98·162						

Mean result = 5·6346

log. C = 6·3632299 Probable error = ·0058

9th SERIES.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.

April 10	449	+	388·242	100·742	10·9930					5·5969
	450	−	397·377	88·492	10·9986	395·602	6·602	10·9958	5·4391	
	451	+	399·414	102·652		400·225	6·614		5·5569	
	452	−	404·696	90·357		403·605	6·510		5·7414	
	453	+	405·616	104·105		405·766	6·686		5·6503	
	454	−	407·139	91·107						
11	455	+	382·807	107·807	10·9936					5·6040
	456	−	384·073	95·855	10·9992	383·471	5·957	10·9964	5·6634	
	457	+	382·933	107·732		383·157	6·077		5·5425	
	458	−	382·690	95·300		382·931	5·944		5·6598	
	459	+	383·414	106·645		383·111	6·046		5·5696	
	460	−	382·929	93·805		384·022	6·175		5·4792	
	461	+	386·816	105·665		387·210	5·697		6·0379	
	462	−	392·277	94·735		391·952	6·393		5·5132	
	463	+	396·438	109·377		396·762	6·730		5·3664	
	464	−	401·895	97·100						
12	465	+	379·616	103·822	10·9959					5·6910
	466	−	380·983	92·035	10·9999	380·822	5·854	10·9979	5·6821	
	467	+	381·708	103·665		381·433	5·990		5·5710	
	468	−	381·333	91·335		382·096	5·906		5·6699	
	469	+	384·013	102·632		384·689	5·811		5·8411	
	470	−	389·397	90·685						
13	471	+	383·496	101·855	11·0002					5·7113
	472	−	386·140	89·440	11·0000	386·317	6·229	11·0001	5·4931	
	473	+	389·493	101·942		391·945	5·918		5·9514	
	474	−	402·654	90·770		400·003	6·285		5·8367	
	475	+	405·211	104·740		405·102	6·762		5·5642	
	476	−	407·334	91·662						

Table II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
April 14	477	+	407·042	101·542	10·9935					5·7260
	478	−	412·299	88·902	11·0006	409·974	6·693	10·9971	5·7607	
	479	+	408·259	103·037		409·307	6·705		5·7317	
	480	−	408·413	90·350		408·246	6·582		5·8086	
	481	+	407·899	103·992		408·207	6·690		5·7137	
	482	−	408·619	90·872		408·207	6·665		5·7352	
	483	+	407·691	104·412		407·720	6·691		5·6992	
	484	−	406·881	91·187		406·602	6·647		5·7055	
	485	+	406·955	104·550		406·915	6·656		5·7066	
	486	−	406·871	91·287		406·791	6·662		5·6980	
	487	+	406·467	104·675		406·477	6·648		5·7012	
	488	−	406·103	91·472						
18	489	+	386·927	96·927	10·9922					5·6673
	490	−	389·891	84·437	11·0016	391·923	6·485	10·9969	5·4337	
	491	+	400·986	97·887		398·984	6·479		5·6364	
	492	−	404·073	85·422		403·999	6·420		5·8321	
	493	+	406·864	98·637		406·194	6·685		5·6619	
	494	−	406·978	85·110		407·228	6·711		5·6688	
	495	+	408·093	98·427		407·595	6·604		5·7710	
	496	−	407·217	85·327						
19	497	−	401·778	85·222	11·0013					5·6978
	498	+	406·814	98·257	10·9969	405·539	6·573	10·9991	5·7376	
	499	−	406·750	85·000		406·730	6·669		5·6882	
	500	+	406·605	98·422		406·607	6·661		5·6916	
	501	−	406·470	85·200		406·462	6·677		5·6740	
	502	+	406·303	98·687						

Mean result = 5·6721

log. C = 6·3603556

Probable error = ·0143

10th Series.—2-inch *Lead* balls, with bifilar *brass* wire; distance = ·415 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
April 23	503	+	175·974	103·947	10·9910					5·7101
	504	−	176·755	101·490	11·0123	176·375	1·258	11·0017	5·6678	
	505	+	176·016	104·065		176·341	1·239		5·7525	
	506	−	176·579	101·685						
27	507	−	177·143	99·715	11·0042					5·6703
	508	+	176·807	102·230	10·9998	176·841	1·259	10·9970	5·6981	
	509	−	176·610	99·707		176·701	1·257		5·6982	
	510	+	176·777	102·215		176·737	1·249		5·7370	
	511	−	176·784	99·727		176·781	1·254		5·7170	
	512	+	176·782	102·257		176·725	1·262		5·6771	
	513	−	176·553	99·737		176·710	1·264		5·6672	
	514	+	176·955	102·275		176·749	1·258		5·6967	
	515	−	176·533	99·780		176·687	1·246		5·7476	
	516	+	176·727	102·270		176·687	1·248		5·7383	
	517	−	176·762	99·767		176·780	1·287		5·5703	
	518	+	176·871	102·412		176·878	1·312		5·4702	
	519	−	177·010	99·807		176·905	1·277		5·6219	
	520	+	176·731	102·312						

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
April 28	521	+	176·596	102·192	10·9911					5·7020
	522	−	176·818	99·730	11·0024	176·745	1·253	10·9968	5·7194	
	523	+	176·750	102·280		176·829	1·246		5·7570	
	524	−	177·000	99·845		176·887	1·248		5·7515	
	525	+	176·801	102·405		176·902	1·258		5·7068	
	526	−	177·009	99·932		176·892	1·265		5·6746	
	527	+	176·750	102·520		176·812	1·261		5·6876	
	528	−	176·742	100·065		176·766	1·256		5·7072	
	529	+	176·830	102·637		176·788	1·256		5·7086	
	530	−	176·750	100·185		176·731	1·254		5·7140	
	531	+	176·594	102·750		176·717	1·260		5·6858	
	532	−	176·931	100·275		176·712	1·260		5·6855	
	533	+	176·392	102·842		176·612	1·272		5·6255	
	534	−	176·734	100·320						
								Mean result =	5·6880	
			log. C = 6·3603556					Probable error =	·0069	
11th SERIES.—2-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.										
April 29	535	+	210·817	102·090	10·9925					5·7029
	536	−	210·000	98·475	11·0004	210·268	1·795	10·9965	5·6508	
	537	+	210·255	102·040		210·237	1·779		5·7000	
	538	−	210·439	98·487		210·345	1·767		5·7446	
	539	+	210·250	102·005		210·283	1·768		5·7380	
	540	−	210·194	98·450		210·222	1·775		5·7120	
	541	+	210·250	101·995		210·221	1·769		5·7313	
	542	−	210·192	98·465		210·246	1·774		5·7165	
	543	+	210·352	102·032		210·324	1·778		5·7079	
	544	−	210·401	98·487		210·403	1·785		5·6898	
	545	+	210·458	102·085		210·365	1·786		5·6846	
	546	−	210·146	98·540		210·214	1·785		5·6796	
	547	+	210·107	102·135		210·170	1·784		5·6804	
	548	−	210·320	98·592						
30	549	+	207·722	103·445	10·9940					5·6246
	550	−	212·032	99·872	11·0015	209·778	1·752	10·9977	5·7613	
	551	+	207·327	103·310		208·671	1·729		5·7765	
	552	−	208·000	99·830		207·750	1·758		5·6312	
	553	+	207·673	103·382		207·844	1·797		5·5140	
	554	−	208·032	99·747		208·101	1·803		5·5092	
	555	+	208·666	103·325		208·662	1·798		5·5544	
	556	−	209·286	99·710						
May 1	557	−	210·300	100·400	11·0007					5·6881
	558	+	210·221	103·942	10·9945	210·287	1·777	10·9976	5·7080	
	559	−	210·406	100·377		210·439	1·772		5·7324	
	560	+	210·725	103·900		210·580	1·789		5·6855	
	561	−	210·467	100·267		210·596	1·796		5·6642	
	562	+	210·727	103·820		210·662	1·796		5·6677	
	563	−	210·727	100·187		210·662	1·795		5·6709	
	564	+	210·467	103·737						
2	565	−	208·000	100·247	11·0014					5·6863
	566	+	212·750	103·772	10·9952	210·491	1·734	10·9983	5·8601	
Continued.	567	−	208·465	100·360		209·433	1·766		5·6963	

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	568	+	208·502	104·015		208·598	1·769		5·6413	5·6863
	569	−	208·926	100·592		208·838	1·752		5·7092	
	570	+	209·000	104·177		209·035	1·768		5·6682	
	571	−	209·216	100·690		209·223	1·748		5·7434	
	572	+	209·460	104·195		209·463	1·761		5·7141	
	573	−	209·717	100·655		209·651	1·772		5·6888	
	574	+	209·710	104·205		209·713	1·770		5·6986	
	575	−	209·716	100·675		209·776	1·783		5·6604	
	576	+	209·964	104·277		209·965	1·810		5·5861	
	577	−	210·218	100·637		210·152	1·805		5·6115	
	578	+	210·211	104·220		210·214	1·786		5·6745	
	579	−	210·217	100·657		210·214	1·792		5·6555	
	580	+	210·213	104·262						
								Mean result =	5·6821	
			log. C = 6·3603556					Probable error =	·0072	
12th SERIES.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.										
May 4	581	+	171·154	102·812	10·9974					5·7660
	582	−	172·277	100·482	10·9992	171·840	1·178	10·9983	5·6224	
	583	+	171·650	102·867		171·904	1·159		5·7188	
	584	−	172·039	100·615		172·075	1·138		5·8359	
	585	+	172·573	102·917		172·346	1·154		5·7731	
	586	−	172·199	100·602		172·474	1·141		5·8476	
	587	+	172·926	102·852		172·666	1·185		5·6430	
	588	−	172·615	100·360		173·020	1·151		5·8336	
	589	+	173·927	102·472		173·322	1·193		5·6478	
	590	−	172·821	99·810		173·444	1·170		5·7670	
	591	+	174·207	101·830		173·707	1·151		5·8800	
	592	−	173·594	99·245		173·876	1·197		5·6650	
	593	+	174·112	101·450		173·948	1·139		5·9584	
	594	−	173·976	99·097						
6	595	−	178·924	101·435	10·9992					5·7325
	596	+	179·145	103·860	10·9974	178·938	1·264	10·9983	5·6816	
	597	−	178·540	101·227		178·831	1·252		5·7292	
	598	+	179·102	103·605		178·965	1·239		5·7980	
	599	−	179·116	101·025		179·219	1·250		5·7633	
	600	+	179·542	103·445		179·382	1·255		5·7508	
	601	−	179·328	100·845		179·462	1·265		5·7102	
	602	+	179·652	103·305	10·9965	179·531	1·269		5·6963	
	603	−	179·493	100·687	11·0011	179·519	1·277	10·9988	5·6599	
	604	+	179·442	103·180		179·471	1·256		5·7514	
	605	−	179·508	100·647		179·470	1·252		5·7697	
	606	+	179·422	103·125		179·451	1·251		5·7731	
	607	−	179·452	100·597		179·410	1·265		5·7066	
	608	+	179·315	103·130						
7	609	+	173·231	102·925	10·9974					5·7859
	610	−	172·907	100·372	11·0010	173·108	1·182	10·9992	5·6854	
	611	+	173·387	102·550		173·283	1·148		5·8656	
	612	−	173·451	100·135		173·601	1·186		5·6986	
	613	+	174·117	102·467		174·034	1·153		5·8909	
	614	−	174·453	100·187		174·416	1·167		5·8458	
Continued.	615	+	174·644	102·577		174·911	1·148		5·9764	

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	616	−	175·906	100·375		175·789	1·159		5·9793	5·7859
	617	+	176·703	102·812		176·679	1·219		5·7427	
	618	−	177·407	100·372		177·304	1·217		5·7928	
	619	+	177·700	102·800		177·818	1·271		5·5789	
	620	−	178·465	100·142		178·190	1·261		5·6467	
	621	+	178·132	102·530		178·185	1·243		5·7282	
	622	−	178·013	99·947						
May 8	623	+	173·801	103·282	10·9970					5·7531
	624	−	172·675	100·921	11·0012	172·941	1·168	10·9991	5·7426	
	625	+	172·616	103·232		172·764	1·153		5·8054	
	626	−	173·151	100·930		173·057	1·153		5·8251	
	627	+	173·310	103·242		173·181	1·191		5·6473	
	628	−	172·954	100·790		173·092	1·183		5·6796	
	629	+	173·151	103·070		173·183	1·156		5·8184	
	630	−	173·478	100·727						

Mean result = 5·7603

log. C = 6·3506819

Probable error = ·0087

13th SERIES.—2-inch *Glass* balls (loaded), with bifilar *iron* wire; distance = ·415 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
May 9	631	+	116·703	101·407	10·9967					5·8015
	632	−	116·500	100·342	11·0003	116·472	0·524	10·9985	5·8065	
	633	+	116·187	101·375		116·343	·528		5·7497	
	634	−	116·500	100·297		116·442	·529		5·7486	
	635	+	116·584	101·337		116·667	·522		5·8482	
	636	−	117·000	100·290		116·833	·522		5·8649	
	637	+	116·750	101·332		116·802	·515		5·9415	
	638	−	116·711	100·315		116·709	·509		6·0020	
	639	+	116·667	101·355		116·626	·509		5·9934	
	640	−	116·460	100·317		116·611	·534		5·7114	
	641	+	116·859	101·437		116·782	·544		5·6228	
	642	−	116·953	100·380		116·908	·539		5·6873	
	643	+	116·870	101·482		116·973	·544		5·6412	
	644	−	117·199	100·407						
10	645	+	117·361	100·445	10·9967					5·6825
	646	−	117·650	99·400	11·0019	117·422	·550	10·9993	5·6218	
	647	+	117·028	100·557		117·330	·543		5·6854	
	648	−	117·615	99·540		117·352	·522		5·9163	
	649	+	117·153	100·612		117·385	·540		5·7223	
	650	−	117·620	99·522		117·514	·555		5·5799	
	651	+	117·665	100·652		117·623	·543		5·7137	
	652	−	117·549	99·610		117·548	·542		5·7170	
	653	+	117·434	100·737		117·561	·546		5·6764	
	654	−	117·830	99·680		117·699	·546		5·6897	
	655	+	117·702	100·807		117·753	·543		5·7264	
	656	−	117·780	99·760		117·743	·534		5·8219	
	657	+	117·712	100·850		117·744	·530		5·8660	
	658	−	117·773	99·820		117·717	·529		5·8744	
	659	+	117·613	100·907		117·691	·535		5·8059	
	660	−	117·768	99·855		117·600	·546		5·6801	
	661	+	117·250	100·990		117·568	·539		5·7508	
	662	−	118·004	99·967		117·757	·539		5·7693	
Continued.	663	+	117·770	101·082		117·763	·570		5·4561	

Table II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
Continued.	664	−	117·511	99·915		117·698	0·598		5·1949	5·6825
	665	+	118·000	101·140		117·874	·579		5·3814	
	666	−	117·988	100·050						
May 12	667	+	117·470	100·880	10·9966					5·7893
	668	−	117·790	99·840	11·0012	117·666	·532	10·9989	5·8366	
	669	+	117·616	100·930		117·697	·540		5·7531	
	670	−	117·768	99·860		117·692	·536		5·7956	
	671	+	117·617	100·935		117·695	·532		5·8395	
	672	−	117·780	99·880		117·606	·536		5·7871	
	673	+	117·250	100·972		117·450	·533		5·8043	
	674	−	117·518	99·930		117·479	·538		5·7532	
	675	+	117·630	101·042		117·632	·538		5·7682	
	676	−	117·750	100·000		117·663	·535		5·8036	
	677	+	117·525	101·100		117·572	·532		5·8273	
	678	−	117·491	100·070		117·476	·537		5·7636	
	679	+	117·399	101·190		117·447	·539		5·7394	
	680	−	117·500	100·152						

Mean result = 5·7441

log. C = 6·3506819   Probable error = ·0127

14th Series.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

May 13	681	+	……	100·803	10·9959					5·7207
	682	−	152·056	98·972	11·0015	152·270	0·900	10·9987	5·6459	
	683	+	152·484	100·742		152·346	·900		5·6516	
	684	−	152·363	98·910		152·483	·889		5·7318	
	685	+	152·725	100·635		152·444	·912		5·5844	
	686	−	151·966	98·712		152·468	·895		5·6922	
	687	+	153·215	100·372		152·694	·849		6·0184	
	688	−	152·383	98·367						
14	689	+	151·527	100·027	10·9974					5·6762
	690	−	152·530	98·470	11·0032	152·013	·888	11·0003	5·7013	
	691	+	151·467	100·467		151·919	·920		5·4962	
	692	−	152·215	98·785		151·960	·872		5·8017	
	693	+	151·944	100·592		151·931	·890		5·6823	
	694	−	151·622	98·837		151·813	·870		5·7773	
	695	+	152·065	100·565		151·878	·889		5·6847	
	696	−	151·763	98·737		151·954	·892		5·6713	
	697	+	152·228	100·478		152·057	·891		5·6854	
	698	−	152·009	98·655		152·136	·891		5·6913	
	699	+	152·298	100·397		152·232	·893		5·6857	
	700	−	152·325	98·567		152·330	·909		5·5928	
	701	+	152·375	100·375		152·346	·899		5·6432	
	702	−	152·310	98·587						
	703	+	153·777	100·107	10·9973					5·7319
	704	−	153·702	98·097	11·0031	153·777	·942	11·0002	5·5765	
	705	+	153·928	99·857		153·880	·885		5·8621	
	706	−	153·962	98·077		153·957	·915		5·6756	
	707	+	153·978	99·957		154·091	·905		5·7483	
	708	−	154·446	98·217		154·227	·901		5·7840	
	709	+	154·041	100·082		154·217	·907		5·7450	
	710	−	154·340	98·320						

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
May 15	711	+	153·536	98·592	10·9976					
	712	−	153·157	96·562	11·0051	153·190	0·970	11·0013	5·2995	
	713	+	152·912	98·412		153·317	·887		5·8050	
	714	−	154·288	96·712		153·773	·948		5·4638	
	715	+	153·604	98·805		153·998	·973		5·3390	
	716	−	154·496	97·007		154·153	·954		5·4563	
	717	+	154·019	99·025		154·154	·956		5·4450	
	718	−	154·085	97·220		154·122	·913		5·6991	5·5823
	719	+	154·300	99·067		154·371	·912		5·7238	
	720	−	154·800	97·267		154·576	·935		5·5978	
	721	+	154·407	99·210		154·600	·931		5·6236	
	722	−	154·785	97·430		154·760	·900		5·8293	
	723	+	155·063	99·252		154·942	·947		5·5531	
	724	−	154·858	97·285		155·081	·944		5·5807	
	725	+	155·548	99·097		155·461	·923		5·7357	
	726	−	155·892	97·217						
								Mean result =	5·6574	
			log. C = 6·3406469					Probable error =	·0152	
15th SERIES.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.										
May 31	727	+	153·815	102·652	10·9908					
	728	−	153·839	100·882	11·0036	153·645	0·918	10·9972	5·6372	
	729	+	153·090	102·787		153·438	·918		5·6220	
	730	−	153·735	101·020		153·450	·934		5·5266	
	731	+	153·242	102·990		153·451	·949		5·4393	
	732	−	153·588	101·162		153·429	·929		5·5548	
	733	+	153·300	103·050		153·457	·948		5·4454	
	734	−	153·640	101·147		153·579	·935		5·5299	
	735	+	153·737	102·987		153·693	·934		5·5441	
	736	−	153·658	101·090		153·623	·931		5·5575	
	737	+	153·441	102·921		153·495	·923		5·5957	5·5289
	738	−	153·443	101·057		153·420	·919		5·6146	
	739	+	153·352	102·852		153·404	·901		5·7255	
	740	−	153·469	101·042		153·411	·905		5·7008	
	741	+	153·355	102·855		153·355	·914		5·6405	
	742	−	153·240	101·010		153·241	·928		5·5479	
	743	+	153·130	102·880	10·9908	153·106	·912	10·9965	5·6352	
	744	−	152·925	101·100	11·0022	152·932	·920		5·5736	
	745	+	152·751	103·002		152·604	·973		5·2474	
	746	−	151·990	101·010		152·367	·992		5·1310	
	747	+	152·740	102·987		152·469	·960		5·3090	
	748	−	152·406	101·125						
June 1	749	+	154·434	102·245	10·9883					
	750	−	154·512	100·317	11·0037	154·412	·965	10·9960	5·4175	
	751	+	154·189	102·252		154·417	·935		5·5917	
	752	−	154·778	100·445		154·548	·940		5·5714	
	753	+	154·450	102·400		154·682	·939		5·5870	
	754	−	155·052	100·598		154·750	·949		5·5330	5·5831
	755	+	154·446	102·595		154·768	·942		5·5754	
	756	−	155·131	100·825		154·887	·908		5·7931	
	757	+	154·843	102·687		154·990	·935		5·6332	
Continued.	758	−	155·145	100·807		155·103	·945		5·5818	

TABLE II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	759	+	155·282	102·710		155·525	0·950		5·5683	5·5851
	760	−	155·594	100·812		155·459	·955		5·5487	
	761	+	155·567	102·735		155·475	·947		5·5966	
	762	−	155·565	100·870						
June 2	763	+	154·099	104·465	10·9886					5·5815
	764	−	153·023	102·382	11·0050	153·626	·952	10·9958	5·4359	
	765	+	154·560	104·110		153·911	·935		5·5553	
	766	−	155·903	102·097		154·014	·943		5·5155	
	767	+	153·895	105·857		153·878	·929		5·5888	
	768	−	153·825	101·900		155·855	·949		5·4692	
	769	+	153·871	105·742		155·902	·918		5·6575	
	770	−	154·044	101·912		153·876	·912		5·6928	
	771	+	153·547	105·750		155·795	·904		5·7570	
	772	−	154·035	101·930						
							Mean result =		5·5557	
			log. C = 6·3406469				Probable error =		·0133	
16th SERIES.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.										
June 5	773	+	174·666	102·332	10·9901					5·6716
	774	−	174·565	99·875	10·9997	174·599	1·214	10·9949	5·6357	
	775	+	174·604	102·277		174·578	1·211		5·6483	
	776	−	174·541	99·855		174·621	1·200		5·7029	
	777	+	174·799	102·195		174·677	1·210		5·6594	
	778	−	174·571	99·715		174·677	1·211		5·6547	
	779	+	174·770	102·082		174·799	1·197		5·7289	
	780	−	175·085	99·662						
4	781	+	179·841	105·682	10·9908					5·6580
	782	−	177·862	100·777	11·0000	178·766	1·283	10·9954	5·5897	
	783	+	179·502	105·005		178·762	1·275		5·6245	
	784	−	178·184	100·132		178·770	1·290		5·5596	
	785	+	179·210	102·420		178·744	1·259		5·6948	
	786	−	178·374	99·670		178·803	1·275		5·6359	
	787	+	179·255	102·015		178·807	1·262		5·6853	
	788	−	178·344	99·512		178·773	1·280		5·6052	
	789	+	179·149	101·732		178·935	1·264		5·6843	
	790	−	179·090	99·095		179·103	1·275		5·6460	
	791	+	179·085	101·560		179·055	1·261		5·7045	
	792	−	178·882	98·982		178·910	1·259		5·7054	
	793	+	178·790	101·440		178·848	1·246		5·7610	
	794	−	178·930	98·912						
5	795	+	169·469	102·292	10·9931					5·5597
	796	−	173·154	99·462	10·9980	172·538	1·281	10·9955	5·2151	
	797	+	174·378	101·757		175·854	1·216		5·5779	
	798	−	173·508	99·187		173·792	1·234		5·4926	
	799	+	173·777	101·555		173·754	1·208		5·6084	
	800	−	175·954	99·092		173·920	1·219		5·5684	
	801	+	173·993	101·487		173·973	1·197		5·6742	
	802	−	173·953	99·095		173·980	1·209		5·6184	
	803	+	174·020	101·540		175·959	1·226		5·5391	
Continued.	804	−	173·845	99·080		175·700	1·238		5·4691	

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	805	+	173·090	101·575		173·387	1·200		5·6220	
	806	−	173·524	99·270		173·431	1·176		5·7396	5·5597
	807	+	173·586	101·672		173·495	1·208		5·5917	
	808	−	173·285	99·240						
June 6	809	+	174·700	103·267	10·9938					
	810	−	173·039	100·422	10·9981	173·822	1·237	10·9959	5·4808	
	811	+	174·512	102·525		173·961	1·174		5·7842	
	812	−	173·784	99·932		174·049	1·223		5·5580	
	813	+	174·116	102·232		173·964	1·194		5·6875	
	814	−	173·842	99·755		173·962	1·213		5·5983	5·6211
	815	+	174·049	102·130		173·766	1·250		5·4203	
	816	−	173·124	99·505		173·561	1·229		5·5000	
	817	+	173·949	101·797		173·793	1·173		5·7779	
	818	−	174·151	99·395		174·110	1·193		5·7018	
	819	+	174·191	101·765		174·197	1·204		5·6554	
	820	−	174·256	99·317		174·218	1·204		5·6567	
	821	+	174·171	101·685		174·198	1·209		5·6320	
	822	−	174·196	99·215						

Mean result = 5·6213

log. C = 6·3506819

Probable error = ·0119

17th Series.—2-inch *Lead* balls, with bifilar *iron* wire (shortened); distance = ·415 inch.

June 8	823	+	168·205	103·819	11·0002					
	824	−	168·135	101·460	10·9978	168·167	1·168	10·9990	5·5523	5·5523
	825	+	168·194	103·775						
	826	+	168·936	103·485	10·9981					
	827	−	168·597	101·222	10·9955	168·830	1·140	10·9968	5·7359	
	828	+	169·190	103·522		168·931	1·164		5·6244	
	829	−	168·750	101·165		168·908	1·182		5·5372	
	830	+	168·942	103·537		168·866	1·142		5·7283	
	831	−	168·832	101·342		168·885	1·142		5·7296	
	832	+	168·936	103·717		168·908	1·179		5·5513	
	833	−	168·931	101·377		168·916	1·164		5·6104	5·6552
	834	+	168·869	103·695		168·899	1·142		5·7306	
	835	−	168·928	101·445		168·915	1·124		5·8234	
	836	+	168·935	103·692		168·935	1·197		5·5970	
	837	−	168·943	101·150		168·979	1·212		5·4047	
	838	+	169·096	103·457		169·018	1·132		5·7893	
	839	−	168·938	101·235						
9	840	+	168·390	101·122	10·9974					
	841	−	167·906	98·752	10·9950	168·085	1·182	10·9962	5·4840	
	842	+	168·139	101·112		167·958	1·164		5·5603	
	843	−	167·648	98·817		167·858	1·167		5·5395	
	844	+	168·000	101·190		167·912	1·111		5·8224	5·6288
	845	−	168·000	99·117		167·956	1·112		5·8202	
	846	+	167·825	101·495		167·858	1·190		5·4324	
	847	−	167·784	99·312		167·806	1·125		5·7427	
	848	+	167·832	101·632						
	849	+	169·320	101·410	10·9986					
	850	−	169·341	99·095	10·9954	169·331	1·176	10·9970	5·5932	5·6462
Continued.	851	+	169·324	101·485		169·257	1·178		5·5788	

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	852	−	169·042	99·162		169·120	1·154		5·6856	
	853	+	169·073	101·455		168·996	1·164		5·6285	
	854	−	168·796	99·090		168·887	1·158		5·6504	5·6462
	855	+	168·886	101·357		168·903	1·140		5·7407	
	856	−	169·047	99·062						
June 10	857	+	169·013	102·102	10·9968					
	858	−	169·559	99·527	10·9959	169·157	1·227	10·9963	5·3499	
	859	+	168·500	101·862		168·901	1·144		5·7207	
	860	−	169·047	99·622		168·923	1·143		5·7272	
	861	+	169·098	101·957		169·068	1·145		5·7270	
	862	−	169·029	99·712		169·065	1·158		5·6625	
	863	+	169·104	102·080		169·062	1·144		5·7316	
	864	−	169·013	99·872		169·060	1·142		5·7415	5·6578
	865	+	169·112	102·232		169·062	1·177		5·5709	
	866	−	169·012	99·882		169·006	1·180		5·5530	
	867	+	168·887	102·255		168·946	1·157		5·6594	
	868	−	169·000	100·000		169·000	1·138		5·7576	
	869	+	169·115	102·297		169·057	1·152		5·6914	
	870	−	169·001	99·987						
11	871	+	168·311	101·222	10·9950					
	872	−	167·805	98·910	10·9956	167·995	1·160	10·9953	5·5832	
	873	+	168·062	101·240		167·994	1·137		5·6961	
	874	−	168·049	99·020		168·057	1·143		5·6705	5·6826
	875	+	168·069	101·375		167·995	1·157		5·5977	
	876	−	167·795	99·100		167·869	1·130		5·7228	
	877	+	167·817	101·347		167·857	1·110		5·8251	
	878	−	168·000	99·155						

Mean result = 5·6518

log. C = 6·3603556

Probable error = ·0115

18th SERIES.—2½-inch *Lead* balls, with bifilar *brass* wire; distance = ·380 inch.

June 14	879	+	224·956	96·375	10·9958					
	880	−	224·547	92·030	10·9917	224·777	2·128	10·9937	5·4840	
	881	+	225·060	96·200		224·894	2·143		5·4512	
	882	−	224·910	91·797		225·043	2·114		5·5333	5·5247
	883	+	225·293	95·852		225·105	2·109		5·5495	
	884	−	224·926	91·472		225·161	2·089		5·6054	
	885	+	225·500	95·450						
15	886	+	227·196	98·922	10·9937					
	887	−	226·776	94·482	10·9939	227·044	2·141	10·9938	5·5633	
	888	+	227·430	98·607		227·034	2·130		5·5915	
	889	−	226·500	94·210		226·771	2·120		5·6049	
	890	+	226·665	98·295		226·596	2·124		5·5857	5·5790
	891	−	226·556	93·885		226·631	2·137		5·5534	
	892	+	226·750	98·025		226·656	2·129		5·5755	
	893	−	226·568	93·650						
	894	+	227·009	105·177	10·9942					
	895	−	226·000	100·780	10·9930	226·376	2·134	10·9936	5·5487	5·5276
	896	+	226·496	104·920		226·304	2·149		5·5065	
	897	−	226·227	100·465						

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = ∂.	Single.	Daily.
June 16	898	+	225·094	101·875	10·9947					5·5141
	899	−	224·873	97·545	10·9947	224·980	2·110	10·9947	5·5417	
	900	+	225·083	101·655		225·010	2·100		5·5696	
	901	−	225·000	97·365		225·020	2·126		5·5020	
	902	+	225·000	101·580		224·908	2·123		5·5043	
	903	−	224·635	97·302		224·773	2·108		5·5368	
	904	+	224·823	101·457		224·730	2·113		5·5216	
	905	−	224·642	97·160		224·792	2·103		5·5509	
	906	+	225·064	101·275		224·980	2·105		5·5549	
	907	−	225·152	96·970		225·170	2·133		5·4912	
	908	+	225·310	101·200		225·318	2·142		5·4754	
	909	−	225·500	96·860		225·408	2·138		5·4900	
	910	+	225·303	101·072		225·339	2·160		5·4309	
	911	−	225·250	96·645						
17	912	+	225·766	100·325	10·9941					5·5345
	913	−	225·693	96·145	10·9937	225·667	2·098	10·9939	5·6084	
	914	+	225·518	100·357		225·544	2·137		5·5001	
	915	−	225·449	96·020		225·481	2·134		5·5306	
	916	+	225·509	100·182		225·480	2·110		5·5673	
	917	−	225·455	95·902		225·543	2·123		5·5363	
	918	+	225·756	100·117		225·606	2·134		5·5368	
	919	−	225·460	95·797		225·606	2·132		5·5160	
	920	+	225·750	100·005		225·669	2·133		5·5165	
	921	−	225·716	95·680		225·733	2·145		5·4888	
	922	+	225·750	99·937		225·733	2·143		5·4939	
	923	−	225·719	95·622		225·794	2.118		5·5617	
	924	+	225·989	99·782		225·799	2·122		5·5515	
	925	−	225·500	95·455		225·680	2·131		5·5222	
	926	+	225·732	99·652		225·616	2·120		5·5477	
	927	−	225·500	95·370		225·620	2·123		5·5401	
	928	+	225·750	99·580						

Mean result = 5·5335

log. C = 6·3632299

Probable error = ·0044

19th SERIES.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·380 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = ∂.	Single.	Daily.
June 18	929	+	239·831	101·616	10·9930					5·5452
	930	−	239·408	96·842	10·9946	239·577	2·390	10·9938	5·5488	
	931	+	239·663	101·630		239·517	2·392		5·5416	
	932	−	239·315	96·850						
19	933	+	240·338	96·760	10·9930					5·6155
	934	−	240·500	92·892	10·9927	240·560	2·269	10·9928	5·8940	
	935	+	240·905	98·102		240·765	2·510		5·3371	
	936	−	240·750	93·272						
20	937	+	240·323	103·235	10·9915					5·4890
	938	−	240·332	98·362	10·9953	240·411	2·415	10·9934	5·5302	
	939	+	240·658	103·152		240·559	2·424		5·5165	
	940	−	240·588	98·247		240·622	2·451		5·4586	
	941	+	240·657	103·147		240·558	2·415		5·5370	
	942	−	240·331	98·387		240·392	2·424		5·5088	
Continued.	943	+	240·250	103·325		240·290	2·466		5·4104	

TABLE II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	944	−	240·330	98·397		240·290	2·466		5·4104	
	945	+	240·250	103·335		240·226	2·441		5·4629	
	946	−	240·075	98·507		240·162	2·409		5·5325	5·4890
	947	+	240·250	103·315		240·206	2·414		5·5231	
	948	−	240·250	98·465						
June 21	949	+	240·401	103·020	10·9920					
	950	−	240·092	98·162	10·9958	240·121	2·419	10·9939	5·5073	
	951	+	239·900	102·980		240·056	2·375		5·6062	
	952	−	240·335	98·297		240·142	2·425		5·4946	
	953	+	240·000	103·317		240·040	2·466		5·3986	5·4773
	954	−	239·826	98·472		239·891	2·418		5·4990	
	955	+	239·914	103·300		239·913	2·415		5·5068	
	956	−	240·000	98·467		239·898	2·497		5·3253	
	957	+	239·681	103·625		239·789	2·424		5·4807	
	958	−	239·796	99·087						
	959	+	240·448	103·970	10·9922					
	960	−	240·045	99·107	10·9962	240·197	2·427	10·9942	5·4923	
	961	+	240·250	103·955		240·147	2·424		5·4968	5·4956
	962	−	240·045	99·105		240·134	2·428		5·4872	
	963	+	240·198	103·970		240·058	2·418		5·5063	
	964	−	239·792	99·162						
Aug. 7	965	+	240·639	103·555	10·9910					
	966	−	240·571	98·717	10·9892	240·646	2·455	10·9901	5·4540	
	967	+	240·805	103·702		240·635	2·448		5·4691	5·4838
	968	−	240·361	98·895		240·554	2·429		5·5082	
	969	+	240·690	103·807		240·510	2·430		5·5039	
	970	−	240·300	99·000						
10	971	+	235·915	102·330	10·9915					
	972	−	239·000	97·910	10·9909	238·140	2·355	10·9912	5·5667	
	973	+	238·646	102·912		238·659	2·450		5·3742	
	974	−	238·344	98·115		238·495	2·393		5·4947	5·5116
	975	+	238·645	102·892		238·619	2·375		5·5421	
	976	−	238·842	98·167		238·869	2·378		5·5466	
	977	+	239·148	102·955		239·034	2·382		5·5450	
	978	−	239·000	98·215						

Mean result = 5·5005

Probable error = ·0101

log. C = 6·3632299

20th SERIES.—1½-inch *Platina* balls, with *single* copper wire; diameter = ·0219 inch.

Aug. 20	979	+	220·337	105·350	10·9814					
	980	−	220·182	101·272	11·0012	220·177	1·973	10·9913	5·5715	
	981	+	220·009	105·087		220·025	1·978		5·5498	
	982	−	219·901	100·990		219·949	1·962		5·5912	
	983	+	219·987	104·742		219·768	1·995		5·4898	5·5608
	984	−	219·199	100·515		219·449	1·959		5·5743	
	985	+	219·412	104·125		219·257	1·949		5·5931	
	986	−	219·006	99·940		219·259	1·974		5·5224	
	987	+	219·615	103·652		219·445	1·952		5·5939	
	988	−	219·544	99·557						

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Aug. 21	989	+	222·162	101·322	10·9801					5·5986
	990	−	221·500	97·130	11·0019	221·815	2·011	10·9910	5·5482	
	991	+	222·098	100·982		221·776	2·015		5·5352	
	992	−	221·411	96·775		221·806	1·993		5·5978	
	993	+	222·304	100·540		221·971	1·994		5·6034	
	994	−	221·867	96·327		222·137	1·996		5·6061	
	995	+	222·510	100·100		222·210	1·989		5·6296	
	996	−	221·954	95·917		222·221	1·980		5·6557	
	997	+	222·466	99·657		222·272	1·985		5·6441	
	998	−	222·205	95·455		222·334	1·994		5·6217	
	999	+	222·462	99·232		222·346	2·022		5·5445	
	1000	−	222·258	94·922						
22	1001	+	219·776	96·380	10·9802					5·5034
	1002	−	220·030	92·350	11·0010	220·010	2·008	10·9906	5·4668	
	1003	+	220·203	96·352		220·207	1·992		5·5206	
	1004	−	220·392	92·385		220·218	1·982		5·5490	
	1005	+	219·885	96·347		219·984	2·009		5·4628	
	1006	−	219·773	92·272		219·886	1·987		5·5184	
	1007	+	220·115	96·147		220·012	1·995		5·5025	
	1008	−	220·046	92·040						
25	1009	−	218·693	121·150	10·9946					5·4918
	1010	+	219·008	125·165	10·9906	218·850	1·989	10·9926	5·4590	
	1011	−	218·689	121·222		218·786	1·972		5·5029	
	1012	+	218·758	125·170		218·770	1·972		5·5021	
	1013	−	218·877	121·230		218·880	1·977		5·4936	
	1014	+	219·010	125·200		218·959	1·991		5·4590	
	1015	−	218·940	121·205		218·911	1·963		5·5344	
	1016	+	218·756	125·062						
26	1017	+	222·876	104·380	10·9896					5·6416
	1018	−	223·419	100·407	10·9952	223·222	1·969	10·9924	5·7372	
	1019	+	223·177	104·512		223·175	2·030		5·5625	
	1020	−	222·926	100·495		222·987	1·995		5·6505	
	1021	+	222·919	104·460		222·867	1·990		5·6586	
	1022	−	222·704	100·465		222·755	1·995		5·6388	
	1023	+	222·695	104·450		222·638	2·006		5·6020	
	1024	−	222·459	100·412						

Mean result = 5·5637

log. C = 6·3548718

Probable error = ·0074

21st SERIES.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Aug. 26	1025	+	255·242	101·617	10·9898					5·5786
	1026	−	253·896	96·042	10·9942	254·360	2·645	10·9920	5·6164	
	1027	+	254·407	101·047		254·167	2·658		5·5805	
	1028	−	253·958	95·420		254·155	2·668		5·5590	
	1029	+	254·297	100·467		254·142	2·668		5·5585	
	1030	−	254·016	94·842						
27	1031	+	255·031	105·312	10·9887					5·6303
	1032	−	254·776	99·742	10·9947	254·890	2·647	10·9917	5·6359	
	1033	+	254·976	104·760		254·826	2·636		5·6566	
	1034	−	254·577	99·232		254·758	2·662		5·5988	
	1035	+	254·903	104·352						

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1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = ∂.	Single.	Daily.
Aug. 28	1036	+	252·769	105·377	10·9860					5·5549
	1037	−	253·001	99·980	10·9952	253·007	2·648	10·9906	5·5519	
	1038	+	253·259	105·177		253·195	2·650		5·5560	
	1039	−	253·261	99·775		253·382	2·643		5·5789	
	1040	+	253·747	104·947		253·633	2·665		5·5438	
	1041	−	253·777	99·457		253·882	2·657		5·5715	
	1042	+	254·230	104·595		254·071	2·681		5·5298	
	1043	−	254·050	99·010		254·197	2·685		5·5271	
	1044	+	254·458	104·165		254·258	2·669		5·5629	
	1045	−	254·068	98·645		254·195	2·663		5·5726	
	1046	+	254·189	103·780						
29	1047	−	250·557	106·287	10·9938					5·5444
	1048	+	251·810	111·200	10·9882	251·411	2·611	10·9910	5·5594	
	1049	−	251·467	105·670		251·702	2·631		5·5299	
	1050	+	252·066	110·665		251·896	2·632		5·5363	
	1051	−	251·987	105·130		252·136	2·637		5·5364	
	1052	+	252·507	110·145		252·259	2·628		5·5608	
	1053	−	252·035	104·647		252·390	2·639		5·5433	
	1054	+	252·985	109·707						
Sept. 1	1055	+	249·228	98·185	10·9886					5·4737
	1056	−	249·849	93·015	10·9938	249·752	2·620	10·9912	5·4672	
	1057	+	250·082	98·325		250·175	2·625		5·4753	
	1058	−	250·687	93·135		250·594	2·615		5·5147	
	1059	+	250·920	98·407		250·809	2·695		5·3602	
	1060	−	250·710	92·897		250·970	2·635		5·4893	
	1061	+	251·543	97·930		251·201	2·644		5·4806	
	1062	−	251·011	92·387		251·264	2·649		5·4730	
	1063	+	251·494	97·442		251·327	2·646		5·4820	
	1064	−	251·309	91·912		251·390	2·634		5·4682	
	1065	+	251·450	97·000		251·387	2·626		5·5264	
	1066	−	251·342	91·582						

Mean result = 5·5376

log. C = 6·3603556

Probable error = ·0076

22nd Series.—2½-inch hollow *Brass* balls, with *single* copper wire; diam. =·0219 inch.

Sept. 3	1067	+	216·121	102·070	10·9903					5·5006
	1068	−	215·692	98·232	10·9911	215·777	1·906	10·9907	5·5345	
	1069	+	215·606	102·020		215·731	1·904		5·5379	
	1070	−	216·021	98·192		216·078	1·928		5·4866	
	1071	+	216·665	102·077		216·508	1·951		5·4435	
	1072	−	216·684	98·157						
26	1073	+	216·702	101·015	10·9902					5·6742
	1074	−	216·434	97·110	10·9926	216·729	1·858	10·9914	5·7269	
	1075	+	217·346	100·640		216·990	1·867		5·7130	
	1076	−	216·835	96·700		217·071	1·901		5·6151	
	1077	+	217·268	100·367		217·302	1·857		5·7605	
	1078	−	217·840	96·607		218·008	1·997		5·3914	
	1079	+	219·084	100·837		219·255	1·925		5·6598	
	1080	−	221·014	97·365		220·626	1·884		5·8528	
	1081	+	221·393	101·430						

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Sept. 27	1082	+	216·111	103·055	10·9896					5·6666
	1083	−	216·150	99·250	10·9930	216·130	1·890	10·9913	5·5990	
	1084	+	216·111	103·007		216·120	1·875		5·6432	
	1085	−	216·110	99·265		216·155	1·849		5·7243	
	1086	+	216·292	102·922		216·198	1·890		5·6025	
	1087	−	216·098	99·020		216·311	1·865		5·6835	
	1088	+	216·758	102·580		216·483	1·881		5·6442	
	1089	−	216·319	98·617		216·589	1·862		5·7073	
	1090	+	216·960	102·102		216·770	1·858		5·7292	
	1091	−	216·842	98·155						
28	1092	+	221·754	105·027	10·9891					5·6231
	1093	−	221·838	101·067	10·9927	221·857	1·970	10·9909	5·6605	
	1094	+	222·000	104·997		222·105	1·957		5·7108	
	1095	−	222·585	101·097		222·418	1·961		5·7153	
	1096	+	222·504	105·042		222·607	1·973		5·6901	
	1097	−	222·835	101·095		222·611	2·013		5·5773	
	1098	+	222·270	105·202		222·374	2·004		5·5904	
	1099	−	222·121	101·292		222·135	1·974		5·6632	
	1100	+	222·028	105·280		222·083	2·078		5·3772	
	1101	−	222·155	100·955						
29	1102	−	223·425	102·875	10·9928					5·6524
	1103	+	223·041	106·940	10·9880	223·261	1·981	10·9904	5·7010	
	1104	−	223·538	103·080		223·333	1·990		5·6789	
	1105	+	223·218	107·180		223·372	2·009		5·6271	
	1106	−	223·514	103·242		223·371	1·999		5·6552	
	1107	+	223·230	107·302		223·221	1·992		5·6675	
	1108	−	222·911	103·395		222·887	1·999		5·6308	
	1109	+	222·498	107·485		222·681	1·982		5·6686	
	1110	−	222·818	103·645		222·727	1·991		5·6453	
	1111	+	222·777	107·770		222·934	2·012		5·5968	
	1112	−	223·365	103·847						

Mean result = 5·6364

log. C = 6·3544537 Probable error = ·0110

23rd Series.—1½ inch *Platina* balls, with bifilar, *silk* lines; distance = ·367 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Oct. 11	1113	+	241·729	101·832	10·9908					5·6557
	1114	−	241·715	97·142	10·9998	241·733	2·342	10·9953	5·6536	
	1115	+	241·773	101·822		241·761	2·334		5·6743	
	1116	−	241·784	97·165		241·778	2·329		5·6873	
	1117	+	241·774	101·825		241·904	2·331		5·6884	
	1118	−	242·284	97·162		242·133	2·355		5·6410	
	1119	+	242·192	101·922		242·208	2·364		5·6231	
	1120	−	242·166	97·227		242·117	2·357		5·6355	
	1121	+	241·946	101·962		242·020	2·354		5·6382	
	1122	−	242·022	97·280		241·984	2·347		5·6533	
	1123	+	241·949	101·987		241·921	2·342		5·6624	
	1124	−	241·767	97·327						
12	1125	+	236·716	101·437	10·9893					5·6399
	1126	−	236·716	96·892	10·9999	236·759	2·266	10·9946	5·6060	
	1127	+	236·891	101·412		236·764	2·256		5·6311	
Continued.	1128	−	236·559	96·907		236·580	2·215		5·7264	

Table II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	1129	+	236·313	101·265		236·274	2·228		5·6783	5·6399
	1130	−	235·914	96·712		235·988	2·274		5·5499	
	1131	+	235·813	101·255		236·049	2·230		5·6624	
	1132	−	236·656	96·877		236·740	2·295		5·5342	
	1133	+	237·834	101·680		237·923	2·219		5·7811	
	1134	−	239·370	97·607		238·863	2·272		5·6910	
	1135	+	238·881	102·622		239·095	2·340		5·5364	
	1136	−	239·250	98·275		239·133	2·273		5·7013	
	1137	+	239·151	103·022		239·303	2·341		5·5436	
	1138	−	239·660	98·405		239·680	2·290		5·6849	
	1139	+	240·250	102·950		240·165	2·321		5·6317	
	1140	−	240·500	98·212						
Oct. 13	1141	+	236·160	104·097	10·9896					5·6331
	1142	−	236·038	99·620	10·9996	236·050	2·276	10·9946	5·5480	
	1143	+	235·962	104·250		235·991	2·243		5·6242	
	1144	−	236·005	99·907		235·863	2·262		5·5735	
	1145	+	235·481	104·612		235·673	2·217		5·6774	
	1146	−	235·728	100·450		235·424	2·226		5·6425	
	1147	+	234·760	105·195		235·423	2·203		5·7015	
	1148	−	236·444	101·127		236·296	2·178		5·8097	
	1149	+	237·539	105·772		237·140	2·322		5·4884	
	1150	−	237·000	101·127						
14	1151	+	241·637	100·912	10·9905					5·6504
	1152	−	241·731	96·347	10·9995	241·630	2·343	10·9950	5·6467	
	1153	+	241·423	101·155		241·523	2·354		5·6153	
	1154	−	241·518	96·547		241·459	2·331		5·6678	
	1155	+	241·376	101·265		241·401	2·331		5·6650	
	1156	−	241·334	96·657		241·295	2·332		5·6575	
	1157	+	241·138	101·377		241·233	2·334		5·6499	
	1158	−	241·324	96·760						

Mean result = 5·6443

log. C = 6·3548718

Probable error = ·0070

24th Series.—2½-inch hollow *Brass* balls, with bifilar *silk* lines; distance = ·367 inch.

Oct. 15	1159	+	242·220	101·100	10·9918					5·7262
	1160	−	242·677	96·462	10·9990	242·485	2·337	10·9954	5·6954	
	1161	+	242·367	101·172		242·458	2·339		5·6893	
	1162	−	242·424	96·527		242·331	2·309		5·7572	
	1163	+	242·112	101·120		242·143	2·309		5·7483	
	1164	−	241·926	96·475		242·004	2·313		5·7317	
	1165	+	242·053	101·065		242·035	2·312		5·7357	
	1166	−	242·110	96·407						
16	1167	+	234·470	99·922	10·9918					5·7144
	1168	−	235·272	95·830	10·9990	234·901	2·180	10·9954	5·7297	
	1169	+	234·592	100·460		235·067	2·209		5·6624	
	1170	−	235·812	96·255		235·506	2·132		5·8889	
	1171	+	235·808	100·580		236·070	2·108		5·9845	
	1172	−	236·853	96·472		236·539	2·270		5·5795	
	1173	+	236·644	101·445		237·409	2·219		5·7498	
Continued.	1174	−	239·496	97·540		238·598	2·232		5·7738	

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1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	1175	+	238·756	102·565		239·234	2·348		5·5178	5·7144
	1176	−	239·930	98·197		239·601	2·264		5·7401	
	1177	+	239·789	102·887		239·922	2·345		5·5567	
	1178	−	240·180	98·197		240·103	2·283		5·7162	
	1179	+	240·264	102·642		240·105	2·300		5·6740	
	1180	−	239·712	97·877						
Oct. 17	1181	+	232·750	100·000	10·9912					5·7890
	1182	−	233·046	95·635	10·9990	233·451	2·088	10·9951	5·9088	
	1183	+	234·962	99·625		234·239	2·134		5·8206	
	1184	−	233·988	95·080		234·414	2·287		5·4393	
	1185	+	234·718	99·685		235·576	2·021		6·2164	
	1186	−	238·880	96·205		237·326	2·215		5·7565	
	1187	+	236·829	101·587		238·002	2·293		5·5924	
	1188	−	239·470	97·797						
18	1189	+	232·231	99·925	10·9917					5·6852
	1190	−	232·309	95·530	10·9985	232·388	2·141	10·9951	5·7102	
	1191	+	232·705	99·702		232·487	2·173		5·6309	
	1192	−	232·232	95·182		232·526	2·173		5·6328	
	1193	+	232·935	99·355		233·147	2·108		5·8375	
	1194	−	234·486	95·095		234·095	2·225		5·5756	
	1195	+	234·474	99·737		234·838	2·139		5·8367	
	1196	−	235·918	95·822		235·404	2·168		5·7864	
	1197	+	235·308	100·582		235·724	2·242		5·6106	
	1198	−	236·363	96·372		236·095	2·201		5·7332	
	1199	+	236·347	100·967		236·368	2·222		5·6921	
	1200	−	236·416	96·675		236·375	2·260		5·5967	
	1201	+	236·321	101·425		236·424	2·237		5·6566	
	1202	−	236·639	97·225		236·449	2·237		5·6578	
	1203	+	236·197	101·975		236·474	2·246		5·6363	
	1204	−	236·863	97·740						

Mean result = 5·7173

log. C = 6·3544537

Probable error = ·0149

25th SERIES.—2-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.

Dec. 5	1205	+	248·667	121·670	10·9972					5·6291
	1206	−	247·374	116·265	11·0054	248·210	2·578	11·0013	5·4778	
	1207	+	249·426	121·175		248·664	2·599		5·4935	
	1208	−	248·431	115·687		248·831	2·540		5·5876	
	1209	+	249·036	120·362		248·689	2·522		5·6211	
	1210	−	248·253	114·947		248·510	2·438		5·8064	
	1211	+	248·500	119·285		248·125	2·438		5·7884	
	1212	−	247·250	113·872						
6	1213	+	252·837	93·912	11·9982					5·5067
	1214	−	251·266	88·225	11·0030	252·047	2·668	11·0006	5·4587	
	1215	+	252·821	93·212		252·291	2·696		5·4124	
	1216	−	252·259	87·415		252·769	2·695		5·4350	
	1217	+	253·740	92·400		253·262	2·627		5·5974	
	1218	−	253·312	86·877		253·452	2·654		5·5488	
	1219	+	253·447	91·970		253·388	2·634		5·5881	
	1220	−	253·348	86·525						

TABLE II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Dec. 7	1221	+	249·073	105·730	11·0000					5·5414
	1222	−	248·465	100·350	11·0028	248·814	2·520	11·0014	5·6311	
	1223	+	249·255	105·050		248·818	2·556		5·5520	
	1224	−	248·298	99·525		248·828	2·570		5·5222	
	1225	+	249·464	104·282		248·948	2·590		5·4848	
	1226	−	248·566	98·680		249·004	2·584		5·5000	
	1227	+	249·421	103·417		249·003	2·557		5·5581	
	1228	−	248·604	97·925						
8	1229	+	254·330	98·302	11·0000					5·5310
	1230	−	253·713	92·867	11·0028	253·890	2·653	11·0014	5·5693	
	1231	+	253·804	98·045		253·735	2·646		5·5772	
	1232	−	253·618	92·637		253·672	2·689		5·4853	
	1233	+	253·649	97·987		253·666	2·700		5·4627	
	1234	−	253·746	92·537		253·758	2·682		5·5033	
	1235	+	253·891	97·817		253·698	2·690		5·4844	
	1236	−	253·266	92·337		253·449	2·655		5·5458	
	1237	+	253·374	97·480		253·290	2·634		5·5830	
	1238	−	253·146	92·087		253·132	2·640		5·5633	
	1239	+	252·863	97·255		252·945	2·649		5·5363	
	1240	−	252·909	91·827		252·906	2·635		5·5638	
	1241	+	252·944	96·942		252·726	2·663		5·4976	
	1242	−	252·110	91·405						
10	1243	+	253·786	122·862	10·9992					5·3487
	1244	−	253·541	117·087	11·0030	253·563	2·850	11·0011	5·1712	
	1245	+	253·386	122·715		253·427	2·824		5·2133	
	1246	−	253·398	117·045		253·391	2·813		5·2322	
	1247	+	253·381	122·627		253·385	2·706		5·4388	
	1248	−	253·381	117·385		253·445	2·644		5·5690	
	1249	+	253·636	122·720		253·544	2·695		5·4679	
	1250	−	253·523	117·275						

Mean result = 5·5147

log. C = 6·3603556 Probable error = ·0141

26th SERIES.—2½-inch hollow *Brass* balls, with *single* copper wire; diam. = ·0219 inch.

Dec. 11	1251	+	215·302	98·025	10·9983					5·6401
	1252	−	215·284	94·317	11·0053	215·442	1·834	11·0018	5·7223	
	1253	+	215·897	97·947		215·657	1·892		5·5580	
	1254	−	215·549	94·007						
12	1255	+	219·198	99·480	10·9998					5·5670
	1256	−	218·695	95·367	11·0042	219·238	1·962	11·0020	5·5390	
	1257	+	220·365	99·102		220·046	1·989		5·5041	
	1258	−	220·762	94·882		220·687	1·982		5·5558	
	1259	+	220·859	98·592		220·706	1·985		5·5484	
	1260	−	220·346	94·362		220·714	1·986		5·5460	
	1261	+	221·308	98·077		221·324	1·910		5·7985	
	1262	−	222·335	94·150		222·076	2·014		5·5366	
	1263	+	222·328	98·280		222·264	2·017		5·5377	
	1264	−	222·066	94·340		222·139	2·015		5·5370	
	1265	+	222·096	98·460						

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Dec. 13	1266	+	221·945	99·725	10·9983					5·5511
	1267	−	221·410	95·600	11·0026	221·605	2·011	11·0013	5·5220	
	1268	+	221·654	99·520		221·535	1·982		5·5993	
	1269	−	221·422	95·512		221·543	1·995		5·5632	
	1270	+	221·673	99·485		221·552	2·018		5·5002	
	1271	−	221·442	95·385		221·551	2·006		5·5331	
	1272	+	221·647	99·312		221·547	1·982		5·5999	
	1273	−	221·454	95·310		221·495	1·988		5·5804	
	1274	+	221·426	99·262		221·384	2·023		5·4783	
	1275	−	221·232	95·122		221·251	2·027		5·4609	
	1276	+	221·114	99·090		221·053	2·018		5·4755	
	1277	−	220·752	94·987		220·861	1·991		5·5401	
	1278	+	220·827	98·850		220·796	1·978		5·5732	
	1279	−	220·780	94·802		220·750	1·972		5·5879	
	1280	+	220·614	98·642		220·704	1·971		5·5884	
	1281	−	220·810	94·597		220·706	1·966		5·6027	
	1282	+	220·592	98·417		220·646	1·958		5·6225	
	1283	−	220·589	94·405		220·586	1·964		5·6023	
	1284	+	220·575	98·250		220·580	1·984		5·5455	
	1285	−	220·584	94·160		220·632	2·003		5·4955	
	1286	+	220·787	98·085						
14	1287	−	215·364	121·357	11·0041					5·5666
	1288	+	215·756	125·065	10·9975	215·567	1·927	11·0008	5·4535	
	1289	−	215·394	121·065		215·628	1·903		5·5254	
	1290	+	215·968	124·680		215·751	1·888		5·5756	
	1291	−	215·676	120·742		215·877	1·895		5·5615	
	1292	+	216·188	124·385		216·000	1·885		5·5974	
	1293	−	215·951	120·487		216·002	1·896		5·5648	
	1294	+	215·917	124·175		215·815	1·903		5·5350	
	1295	−	215·475	120·250		215·730	1·840		5·7200	
	1296	+	216·053	123·685						

Mean result = 5·5628

log. C = 6·3544537

Probable error = ·0070

27th SERIES.—1½-inch *Platina* balls, with *single* copper wire; diameter =·0219 inch.

Dec. 16	1297	+	219·614	117·275	10·9990					5·4901
	1298	−	219·500	113·192	11·0042	219·552	1·950	11·0016	5·5948	
	1299	+	219·595	116·910		219·575	2·015		5·4155	
	1300	−	219·622	112·567		219·790	2·049		5·3360	
	1301	+	220·321	116·422		220·286	1·973		5·5666	
	1302	−	220·881	112·385		220·852	2·036		5·4221	
	1303	+	221·325	116·492		221·348	1·970		5·6290	
	1304	−	221·864	112·720		221·727	2·041		5·4518	
	1305	+	221·856	117·115		221·913	2·019		5·5204	
	1306	−	222·079	113·435		222·038	2·011		5·5487	
	1307	+	222·140	117·800		222·090	2·061		5·4166	
	1308	−	221·804	113·920						
18	1309	+	220·431	121·812	10·9998					5·5039
	1310	−	220·350	118·000	11·0054	220·247	2·000	11·0026	5·4633	
	1311	+	219·859	122·190		220·036	1·976		5·5446	
	1312	−	220·076	118·475						

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Dec. 19	1313	+	218·831	96·625	11·0022					5·5971
	1314	−	218·112	92·770	11·0070	218·347	1·936	11·0046	5·5705	
	1315	+	218·333	96·662		218·251	1·958		5·5031	
	1316	−	218·228	92·722		218·154	1·948		5·5265	
	1317	+	217·829	96·575		217·842	1·935		5·5477	
	1318	−	217·481	92·687		217·465	1·901		5·6274	
	1319	+	217·070	96·405		217·124	1·898		5·6186	
	1320	−	216·874	92·530		216·906	1·861		5·7188	
	1321	+	216·805	96·102		216·720	1·897		5·6007	
	1322	−	216·396	92·087		216·534	1·936		5·4784	
	1323	+	216·541	95·817		216·467	1·834		5·7795	
	1324	−	216·389	92·212						
20	1325	+	218·208	102·085	11·0010					5·5850
	1326	−	218·434	98·162	11·0070	218·443	1·933	11·0040	5·5847	
	1327	+	218·697	101·972		218·733	1·974		5·4832	
	1328	−	219·106	97·887		219·184	1·928		5·6372	
	1329	+	219·826	101·517		219·624	1·882		5·7982	
	1330	−	219·738	97·617		219·861	1·925		5·6810	
	1331	+	220·142	101·417		220·132	1·949		5·6248	
	1332	−	220·508	97·420		220·326	2·009		5·4665	
	1333	+	220·146	101·462		220·510	1·974		5·5727	
	1334	−	221·239	97·607		221·015	2·030		5·4438	
	1335	+	221·437	101·875		221·489	1·997		5·5575	
	1336	−	221·842	98·155						

Mean result = 5·5541

log. C = 6·3548718

Probable error = ·0123

28th SERIES.—2-inch *Zinc* balls, with *single* copper wire; diameter = ·0219 inch.

Dec. 21	1337	+	198·040	104·310	11·0010					5·6100
	1338	−	198·875	100·997	11·0046	198·712	1·607	11·0028	5·6032	
	1339	+	199·061	104·112		199·098	1·679		5·3838	
	1340	−	199·398	100·510		199·535	1·660		5·4693	
	1341	+	200·282	103·550		200·051	1·630		5·5988	
	1342	−	200·243	100·070		200·415	1·568		5·8414	
	1343	+	200·893	102·865		200·722	1·594		5·7637	
	1344	−	200·858	99·282						
22	1345	+	199·551	90·512	11·0006					5·4450
	1346	−	199·773	87·267	11·0022	199·663	1·613	11·0014	5·6373	
	1347	+	199·548	90·477		199·567	1·630		5·5719	
	1348	−	199·392	87·165		199·959	1·546		5·8991	
	1349	+	201·504	90·040		200·621	1·669		5·5006	
	1350	−	200·126	86·240		200·554	1·788		5·1311	
	1351	+	200·459	89·592		200·298	1·732		5·2835	
	1352	−	200·148	86·017		200·306	1·732		5·2838	
	1353	+	200·468	89·370		200·265	1·818		5·0319	
	1354	−	199·978	85·450		200·318	1·741		5·2572	
	1355	+	200·850	88·497		200·854	1·572		5·8536	
	1356	−	201·737	85·255						

Mean result = 5·5070

log. C = 6·3582236

Probable error = ·0540

29th SERIES.—2-inch *Zinc* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Dec. 24	1357	+	244·835	109·340	10·9976					5·7434
	1358	−	243·171	104·315	11·0026	244·183	2·190	11·0001	6·2116	
	1359	+	245·555	108·052*		244·852	2·325		5·8830	
	1360	−	245·127	102·490		245·553	2·695		5·1044	
	1361	+	246·406	107·710		246·584	2·351		5·9005	
	1362	−	248·397	103·527		247·277	2·435		5·7291	
	1363	+	245·909	109·087		247·059	2·464		5·6517	
	1364	−	248·021	104·790						
26	1365	+	236·055	106·220	10·9921					5·7079
	1366	−	236·145	101·775	11·0043	236·069	2·218	10·9982	5·7343	
	1367	+	235·930	106·202		235·937	2·227		5·7048	
	1368	−	235·742	101·720		236·064	2·175		5·8474	
	1369	+	236·844	105·940		236·451	2·223		5·7400	
	1370	−	236·373	101·267		236·472	2·221		5·7461	
	1371	+	236·298	105·480		236·801	2·347		5·4528	
	1372	−	238·235	100·305		237·733	2·250		5·7327	
	1373	+	238·163	104·132		238·220	2·166		5·9795	
	1374	−	238·321	99·295		238·414	2·391		5·4256	
	1375	+	238·853	104·022		239·334	2·287		5·7162	
	1376	−	241·310	99·600						
27	1377	+	239·431	104·802	10·9929					5·7307
	1378	−	240·002	99·992	11·0063	239·945	2·300	10·9996	5·7115	
	1379	+	240·345	104·382		239·881	2·296		5·7184	
	1380	−	238·833	99·587		239·336	2·275		5·7450	
	1381	+	238·334	103·895		238·214	2·228		5·8113	
	1382	−	237·356	99·292		237·340	2·271		5·6594	
	1383	+	236·316	103·775		236·639	2·179		5·8637	
	1384	−	236·569	99·542		236·221	2·250		5·6585	
	1385	+	235·431	104·312		236·044	2·239		5·6779	
	1386	−	236·744	100·125						
28	1387	+	239·090	104·360	10·9922					5·7264
	1388	−	240·514	99·892	11·0064	240·612	2·274	10·9993	5·8093	
	1389	+	242·330	104·320		241·942	2·305		5·7947	
	1390	−	242·595	99·527		243·146	2·257		5·9770	
	1391	+	245·065	103·765		244·252	2·355		5·7805	
	1392	−	244·284	98·582		244·812	2·422		5·6464	
	1393	+	245·617	103·087		245·515	2·386		5·7645	
	1394	−	246·543	98·047		246·480	2·530		5·4793	
	1395	+	247·219	103·127		247·439	2·513		5·5593	
	1396	−	248·777	98·155						

Mean result = 5·7255

log. C = 6·3582236

Probable error = ·0225

30th SERIES.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

1841.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Dec. 29	1397	+	226·300	108·280	10·9911					5·7248
	1398	−	223·653	100·155	11·0063	225·745	2·141	10·9987	5·3383	
	1399	+	229·376	103·595		227·727	1·968		5·9100	
	1400	−	228·503	99·162		229·134	2·112		5·5753	

TABLE II.

1841.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	1401	+	230·156	103·177		230·417	1·945		6·1220	5·7248
	1402	−	232·854	99·410		231·811	2·171		5·5513	
	1403	+	231·381	104·330		232·639	2·036		5·9617	
	1404	−	234·941	101·107		232·958	2·064		5·8970	
	1405	+	230·570	106·140		231·788	2·214		5·4424	
	1406	−	231·073	102·317						
Dec. 30	1407	+	220·868	104·737	10·9905					5·6777
	1408	−	223·359	101·425	11·0069	222·235	1·899	10·9987	5·8329	
	1409	+	221·356	105·712		221·899	2·011		5·4914	
	1410	−	221·525	101·955		221·857	2·851		5·9638	
	1411	+	223·022	105·605		222·003	1·966		5·6094	
	1412	−	220·444	101·390		223·010	1·773		6·2911	
	1413	+	228·133	104·267		224·917	2·181		5·2022	
	1414	−	222·961	98·420		225·765	2·416		4·7315	
	1415	+	229·008	102·240		228·003	1·851		6·2988	
	1416	−	231·037	98·657						
31	1417	+	210·928	108·390	10·9908					5·6681
	1418	−	211·240	105·042	11·0066	211·173	1·719	10·9987	5·8181	
	1419	+	211·286	108·572		211·440	1·733		5·7858	
	1420	−	211·949	105·170		211·836	1·773		5·6764	
	1421	+	212·159	108·862		212·175	1·832		5·5112	
	1422	−	212·433	105·225		212·851	1·794		5·6639	
	1423	+	214·380	108·767		214·063	1·877		5·4752	
	1424	−	215·059	104·802		215·305	1·867		5·5686	
	1425	+	216·722	108·307		216·786	1·803		5·8459	
	1426	−	218·640	104·600						

Mean result = 5·6902

log. C = 6·3506819

Probable error = ·0465

31st SERIES.—2½-inch *Lead* balls, with bifilar *silk* lines; distance = ·367 inch.

1842. January 1	1427	+	255·855	92·092	11·0007					5·6443
	1428	−	255·918	86·645	11·0053	256·072	2·694	11·0030	5·6146	
	1429	+	256·599	91·977		256·447	2·685		5·6499	
	1430	−	256·672	86·567		256·760	2·692		5·6490	
	1431	+	257·096	91·925		257·010	2·694		5·6558	
	1432	−	257·175	86·507		257·299	2·701		5·6538	
	1433	+	257·750	91·895		257·669	2·714		5·6430	
	1434	−	258·000	86·425						
2	1435	+	257·118	96·182	11·0021					5·6314
	1436	−	256·965	90·697	11·0081	257·025	2·719	11·0051	5·6023	
	1437	+	257·054	96·090		257·072	2·706		5·6313	
	1438	−	257·217	90·657		257·260	2·702		5·6479	
	1439	+	257·552	96·032		257·448	2·705		5·6499	
	1440	−	257·471	90·585		257·762	2·729		5·6139	
	1441	+	258·553	96·057		258·328	2·803		5·4897	
	1442	−	258·734	90·315		258·700	2·757		5·5974	
	1443	+	258·780	95·602		258·883	2·656		5·8184	
	1444	−	259·237	90·265						
3	1445	+	256·500	96·875	11·0024					5·6960
	1446	−	256·500	91·510	11·0082	256·585	2·663	11·0053	5·7004	
	1447	+	256·840	96·800		256·732	2·666		5·7005	
Continued.	1448	−	256·750	91·427		256·794	2·678		5·6777	

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	1449	+	256·838	96·767		256·794	2·670		5·6947	
	1450	−	256·750	91·425		256·920	2·691		5·6558	5·6960
	1451	+	257·342	96·847		257·150	2·653		5·7471	
	1452	−	257·167	91·657						
Jan. 4	1453	+	255·475	107·900	11·0029					
	1454	−	255·250	102·687	11·0071	255·196	2·657	11·0050	5·6519	
	1455	+	254·810	108·102		255·057	2·672		5·6140	
	1456	−	255·359	102·830		255·234	2·656		5·6557	
	1457	+	255·409	108·182		255·445	2·652		5·6736	5·6353
	1458	−	255·604	102·925		255·446	2·668		5·6396	
	1459	+	255·167	108·342		255·360	2·696		5·5773	
	1460	−	255·500	102·975						
5	1461	+	258·264	108·115	11·0041					
	1462	−	258·663	102·695	11·0077	258·439	2·773	11·0059	5·5530	
	1463	+	258·168	108·370		258·399	2·752		5·5937	
	1464	−	258·597	103·037		258·635	2·711		5·6887	
	1465	+	259·177	108·550		258·887	2·749		5·6205	5·6444
	1466	−	258·597	103·065		259·136	2·719		5·6939	
	1467	+	260·173	108·457		259·573	2·719		5·7131	
	1468	−	259·351	102·972		259·656	2·759		5·6339	
	1469	+	259·750	108·525		259·837	2·751		5·6582	
	1470	−	260·500	103·072						

Mean result = 5·6488

log. C = 6·3632299

Probable error = ·0066

32nd SERIES.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Jan. 7	1471	+	209·645	103·790	11·0001					
	1472	−	210·444	100·112	11·0075	210·770	1·664	11·0038	5·9820	
	1473	+	212·546	103·092		211·621	1·718		5·8409	5·9286
	1474	−	210·950	99·200		212·004	1·719		5·8586	
	1475	+	213·570	102·187		212·367	1·675		6·0331	
	1476	−	211·381	98·475						
12	1477	+	220·729	103·972	10·9987					
	1478	−	214·284	99·955	11·0087	218·339	1·868	11·0037	5·7184	
	1479	+	224·059	103·412		221·756	1·867		5·9020	5·8776
	1480	−	224·625	99·400		224·908	1·869		6·0645	
	1481	+	226·325	102·867		226·135	1·967		5·8254	
	1482	−	227·268	98·465						
	1483	+	215·757	97·757	10·9977					
	1484	−	225·185	95·815	11·0066	220·815	1·849	11·0033	5·9094	
	1485	+	217·135	101·270		220·656	1·949		5·5981	5·8532
	1486	−	223·171	98·927		221·055	1·725		6·3478	
	1487	+	220·743	103·487		222·153	1·990		5·5574	
	1488	−	223·958	100·085						
15	1489	+	218·650	104·200	10·9985					
	1490	−	218·452	100·477	11·0099	218·840	1·840	11·0042	5·8316	
	1491	+	219·807	104·115		219·087	1·952		5·5094	
	1492	−	218·285	99·945		220·998	1·802		6·0726	
	1493	+	227·615	102·985		223·510	2·189		5·1133	5·6647
	1494	−	220·524	97·270		222·985	2·375		4·6907	
	1495	+	223·277	101·055		223·944	1·841		6·1035	
Continued.	1496	−	228·697	97·475		226·797	2·044		5·6382	

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	1497	+	226·518	102·072		227·832	1·898		6·1275	5·6647
	1498	−	229·597	99·075		228·312	2·016		5·7932	
	1499	+	227·535	104·142		229·035	2·038		5·7670	
	1500	−	231·437	101·055						
Jan. 16	1501	+	218·112	106·725	10·9978					
	1502	−	208·821	102·715	11·0106	213·869	1·612	11·0042	6·3574	6·0524
	1503	+	219·722	105·155		216·148	1·784		5·8676	
	1504	−	216·329	100·457		218·310	1·800		5·9323	
	1505	+	220·860	102·962						
	1506	−	224·880	99·655						
	1507	+	224·892	104·380		225·883	1·959		5·8356	5·8356
	1508	−	228·867	101·267						

Mean result = 5·8184

log. C = 6·3506819 Probable error = ·0391

33rd SERIES.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

Jan. 17	1509	+	202·987	102·850	10·9981					
	1510	−	207·610	100·240	11·0087	205·761	1·528	11·0034	6·0671	5·8070
	1511	+	204·863	103·742		205·436	1·666		5·5469	
	1512	−	204·388	100·580*						
	1513	+	211·757	101·757		208·357*	1·827*		5·2030	5·2030
	1514	−	202·245	97·755						
	1515	+	210·445	99·945						
	1516	−	219·619	97·505		215·365	1·813		5·6018	5·9567
	1517	+	211·777	102·317		215·809	1·695		6·0171	
	1518	−	220·063	100·350		217·951	1·584		6·5666	
	1519	+	219·902	104·722		220·720	1·891		5·6412	
	1520	−	223·015	101·530						
18	1521	+	197·502	108·335	10·9979					
	1522	−	196·098	105·020	11·0095	198·173	1·472	11·0037	5·8417	6·0468
	1523	+	202·994	107·595		199·547	1·444		6·0378	
	1524	−	196·105	104·395		198·460	1·422		6·0646	
	1525	+	198·635	106·885		197·700	1·325		6·4588	
	1526	−	197·425	104·075		197·527	1·433		5·9616	
	1527	+	196·625	107·000		197·056	1·431		5·9415	
	1528	−	197·550	104·200		197·708	1·395		6·1352	
	1529	+	199·109	106·982		198·704	1·457		5·9335	
	1530	−	199·047	103·937						
20	1531	+	195·058	109·847	10·9952					
	1532	−	194·828	106·922	11·0108	195·063	1·385	11·0030	6·0160	6·0414
	1533	+	195·537	109·537		195·312	1·375		6·0752	
	1534	−	195·348	106·652		195·791	1·416		5·9283	
	1535	+	196·932	109·432		196·559	1·394		6·0692	
	1536	−	197·024	106·635		197·091	1·419		5·9946	
	1537	+	197·386	109·515		198·246	1·396		6·1650	
	1538	−	201·190	106·810						
	1539	+	202·678	106·905*						
	1540	−	202·133	103·585		200·302	1·595		5·5083	6·3270
	1541	+	194·306	106·645		197·432	1·989		4·2915	
	1542	−	199·003	101·747		204·253	1·437		6·3576	
	1543	+	224·700	102·600*		215·948	1·116		9·1505	
	1544	−	215·390	98·987						

Mean result = 6·0230

log. C = 6·3406469 Probable error = ·1044

34th SERIES.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·367 inch.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Jan. 23	1545	+	152·250	101·750	10·9952					
	1546	−	152·098	99·902	11·0098	152·336	0·869	11·0025	5·8484	5·9788
	1547	+	152·897	101·530		152·532	0·868		5·8702	
	1548	−	152·235	99·687		152·830	0·840		6·0896	
	1549	+	153·955	101·205		153·258	0·893		5·7603	
	1550	−	152·886	99·152		153·678	0·888		5·8245	
	1551	+	154·987	100·650		154·143	0·803		6·4801	
	1552	−	153·712	98·937						
24	1553	+	151·885	105·817	10·9975					
	1554	−	151·470	104·030	11·0093	151·892	0·854	11·0034	5·9155	5·7846
	1555	+	152·745	105·660		152·193	0·892		5·6860	
	1556	−	151·813	103·722		152·323	0·889		5·7149	
	1557	+	152·922	105·340		152·416	0·908		5·6020	
	1558	−	152·007	103·327		152·476	0·877		5·8047	
	1559	+	152·969	104·822		152·199	0·862		5·8843	
	1560	−	150·850	102·867		151·850	0·848		5·9540	
	1561	+	152·730	104·307		151·647	0·864		5·8282	
	1562	−	150·281	102·292		151·190	0·868		5·7664	
	1563	+	151·470	103·750		150·481	0·860		5·7656	
	1564	−	148·704	101·767		150·051	0·912		5·4058	
	1565	+	151·326	103·435		150·813	0·818		6·0884	
	1566	−	151·897	101·832						
25	1567	+	156·916	101·222	10·9974					
	1568	−	160·069	99·350	11·0063	158·227	1·043	11·0031	5·2563	5·9025
	1569	+	155·855	101·650		157·562	0·917		5·9284	
	1570	−	158·470	100·280		157·475	0·873		6·2203	
	1571	+	157·104	102·405		157·862	0·892		6·1178	
	1572	−	158·770	100·960		157·593	0·928		5·8604	
	1573	+	155·730	103·230		157·697	0·827		6·5848	
	1574	−	160·558	102·192		158·394	0·920		5·9716	
	1575	+	156·730	104·835		157·769	1·100		4·9551	
	1576	−	157·058	103·077		156·960	0·919		5·8704	
	1577	+	156·996	104·955		157·337	0·866		6·2596	
	1578	−	158·300	103·450						

Mean result = 5·8683

log. C = 6·3406469 Probable error = ·0413

35th SERIES.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·367 inch.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Jan. 26	1579	+	190·484	93·125	10·9995					
	1580	−	190·171	90·377	11·0107	190·419	1·368	11·0051	5·8020	5·7909
	1581	+	190·852	93·102		191·197	1·373		5·8282	
	1782	−	192·915	90·335		192·852	1·414		5·7576	
	1583	+	194·727	93·227		194·903	1·417		5·8683	
	1584	−	197·242	90·452		196·787	1·468		5·7745	
	1585	+	197·937	93·550		197·826	1·499		5·7149	
	1586	−	198·188	90·650						
27	1587	+	192·077	108·462	10·9968					
	1588	−	194·493	106·007	11·0129	193·751	1·347	11·0044	6·1013	6·1013
	1589	+	193·942	108·942						

TABLE II.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Jan. 28	1590	+	193·507	108·005	10·9902					
	1591	−	190·075	104·950	11·0096	191·756	1·365	10·9999	5·9023	
	1592	+	193·666	107·357		192·028	1·352		5·9760	
	1593	−	191·307	104·355		192·543	1·397		5·8145	
	1594	+	194·192	106·942		193·472	1·370		5·9865	
	1595	−	194·197	104·047		193·923	1·458		5·6514	5·7226
	1596	+	193·108	106·985		193·873	1·313		6·2723	
	1597	−	195·080	104·670		193·034	1·535		5·3188	
	1598	+	188·871*	108·495		192·247	1·969		4·1127	
	1599	−	196·167	104·445		195·614	1·759		4·7664	
	1600	+	201·253	107·432		201·662	1·200		7·4254	
	1601	−	207·975	105·620						

Mean result = 5·7690

log. C = 6·3406469 Probable error = ·1100

36th SERIES.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·367 inch.

Jan. 30	1602	+	211·375	104·877	10·9900					
	1603	−	212·840	101·547	11·0120	212·671	1·656	11·0010	6·1229	
	1604	+	213·631	104·842		213·596	1·677		6·0990	
	1605	−	214·285	101·430		213·994	1·759		5·8363	6·0383
	1606	+	213·777	105·055		213·727	1·829		5·9990	
	1607	−	213·069	101·362		213·824	1·774		5·7778	
	1608	+	215·382	104·765		215·627	1·630		6·3947	
	1609	−	218·677	101·647						
31	1610	+	211·887	105·775	10·9892					
	1611	−	211·080	101·840	11·0122	211·563	1·826	11·0007	5·4955	5·4955
	1612	+	212·204	105·212						
	1613	+	214·233	104·932	10·9902					
	1614	−	216·910	101·575	11·0128	215·972	2·029	11·0015	5·1532	
	1615	+	215·834	106·337		217·274	1·785		5·9284	
	1616	−	220·517	103·957		218·682	1·846		5·8071	5·7020
	1617	+	217·860	108·962		219·484	1·958		5·5151	
	1618	−	221·698	106·135		220·157	1·795		6·0529	
	1619	+	219·371	110·487		220·452	1·893		5·7550	
	1620	−	221·368	107·265						

Mean result = 5·8413

log. C = 6·3506819 Probable error = ·0578

37th SERIES.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·367 inch.

Feb. 5	1621	+	262·182	105·455	10·9973					
	1622	−	260·905	100·085	11·0038	261·965	2·403	11·0019	6·2550	
	1623	+	263·868	104·327		261·180	2·500		5·9764	
	1624	−	256·079	98·567		257·313	2·793		5·1922	
	1625	+	253·225	103·982		255·273	2·406		5·9321	5·7498
	1626	−	258·564	99·772		256·232	2·625		5·4782	
	1627	+	254·577	106·062		258·165	2·577		5·6647	
	1628	−	264·944	102·045						

Mean result = 5·7498

log. C = 6·3406469 Probable error = ·0961

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.

38th SERIES.—2-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

Feb. 7	1629	+	215·947	107.790	10·9987					
	1630	−	216·992	104·065	11·0171	216·732	1·911	11·0079	5·6275	
	1631	+	216·998	107·987		217·180	1·938		5·5721	5·5918
	1632	−	217·731	104·155		217·365	1·940		5·5758	
	1633	+	217·000	108·085						
	1634	−	217·525	103·810						
	1635	+	217·750	107·797		217·756	1·926		5·6366	5·6366
	1636	−	218·000	104·080						

Mean result = 5·6030

log. C = 6·3603556

Probable error = ·0104

39th SERIES.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.

Feb. 8	1637	+	222·143	95·525	10·9970					
	1638	−	220·437	91·612	11·0084	221·114	1·872	11·0027	5·7195	
	1639	+	221·440	95·190		220·872	1·853		5·7652	
	1640	−	220·143	91·357		220·535	1·847		5·7666	
	1641	+	220·415	94·915		220·396	1·896		5·6105	5·7080
	1642	−	220·610	90·890		220·902	2·000		5·3432	
	1643	+	221·973	94·865		224·839	1·832		6·0430	
	1644	−	234·800	91·510						

Mean result = 5·7080

log. C = 6·3406469

Probable error = ·0575

40th SERIES.—2-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.

Feb. 9	1645	+	556·286	105·237	10·9962					
	1646	−	553·793	82·075	11·0164	552·938	12·990	11·0063	5·3902	5·3902
	1647	+	547·881	110·875						

Mean result = 5·3902

log. C = 6·3603556

Probable error =

TABLE II.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
41st SERIES.—2-inch *Ivory* balls, with bifilar *iron* wire; distance = ·415 inch.										
Feb. 10	1648	+	162·381	108·105	10·9928					5·7867
	1649	−	162·370	106·130	11·0086	162·124	1·037	11·0007	5·5527	
	1650	+	161·377	108·302		162·075	0·975		5·9023	
	1651	−	163·175	106·575		162·277	0·978		5·8988	
	1652	+	161·381	108·762		162·176	0·992		5·8084	
	1653	−	162·768	106·982		162·152	0·997		5·7775	
	1654	+	161·690	109·190		162·454	0·989		5·8460	
	1655	−	163·670	107·440		162·984	0·992		5·8664	
	1656	+	162·907	109·657		163·303	1·045		5·5907	
	1657	−	163·730	107·695		163·460	0·998		5·8652	
	1658	+	163·475	109·725		163·435	1·016		5·7595	
	1659	−	163·060	107·690						
11	1660	+	162·210	109·807	10·9893					5·7221
	1661	−	161·613	107·887	11·0095	161·679	1·019	10·9994	5·6212	
	1662	+	161·281	110·042		161·630	1·010		5·6678	
	1663	−	162·345	108·155		161·856	1·000		5·7405	
	1664	+	161·452	110·270		161·852	0·983		5·8395	
	1665	−	162·161	108·452		161·875	1·001		5·7362	
	1666	+	161·727	110·637		162·078	1·005		5·7277	
	1667	−	162·698	108·802						
							Mean result	=	5·7625	
			log. C = 6·3406469				Probable error	=	·0179	
42nd SERIES.—2-inch *Zinc* balls, with bifilar *iron* wire; distance = ·415 inch.										
Feb. 12	1668	+	196·520	108·055	10·9873					5·6549
	1669	−	196·986	105·057	11·0095	196·707	1·571	10·9984	5·6210	
	1670	+	196·335	108·342		196·621	1·566		5·6340	
	1671	−	196·830	105·362		196·581	1·561		5·6498	
	1672	+	196·328	108·625		196·569	1·554		5·6745	
	1673	−	196·791	105·670		196·631	1·554		5·6781	
	1674	+	196·616	108·932		196·757	1·558		5·6708	
	1675	−	197·005	105·960		196·879	1·537		5·7554	
	1676	+	196·892	109·137		196·821	1·569		5·6347	
	1677	−	196·495	106·037		196·595	1·573		5·6075	
	1678	+	196·500	109·230		196·311	1·564		5·6234	
	1679	−	195·750	106·167						
13	1680	+	192·229	108·915	10·9857					5·6906
	1681	−	191·535	105·860	11·0103	191·785	1·478	10·9980	5·6798	
	1682	+	191·840	108·717		191·690	1·486		5·6437	
	1683	−	191·546	105·630		191·747	1·479		5·6738	
	1684	+	192·057	108·460		191·915	1·471		5·7146	
	1685	−	192·000	105·405		192·022	1·472		5·7171	
	1686	+	192·030	108·240		191·915	1·471		5·7147	
	1687	−	191·601	105·190						
			log. C = 6·3582236				Mean result	=	5·6683	
							Probable error	=	·0068	

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
43rd Series.—2-inch *Glass* balls, with bifilar *iron* wire; distance = ·415 inch.										
Feb. 14	1688	+	172·322	98·645	10·9863					5·7261
	1689	−	172·884	96·465	11·0101	172·465	1·198	10·9982	5·5689	
	1690	+	171·769	99·077		172·073	1·162		5·7154	
	1691	−	171·870	97·042		171·690	1·122		5·8928	
	1692	+	171·250	99·497		171·617	1·182		5·5889	
	1693	−	172·097	97·222		171·910	1·159		5·7193	
	1694	+	172·197	99·582		172·060	1·182		5·6178	
	1695	−	171·750	97·215		171·908	1·155		5·7390	
	1696	+	171·934	99·470		171·933	1·161		5·7110	
	1697	−	172·115	97·080		171·955	1·144		5·7973	
	1698	+	171·658	99·265		171·770	1·120		5·9088	
	1699	−	171·629	96·972						
15	1700	+	174·030	97·707	10·9862					5·8362
	1701	−	174·214	95·382	11·0102	174·314	1·169	10·9982	5·8301	
	1702	+	174·799	97·732		174·516	1·188		5·7501	
	1703	−	174·252	95·330		174·705	1·151		5·9478	
	1704	+	175·516	97·532		175·157	1·162		5·9221	
	1705	−	175·344	95·085		175·622	1·198		5·7746	
	1706	+	176·287	97·432		175·824	1·197		5·7928	
	1707	−	175·378	94·992						
						Mean result	=		5·7674	
			log. C = 6·3506819			Probable error	=		·0189	
44th Series.—2-inch *Glass* balls, with bifilar *silk* lines; distance = ·415 inch.										
Feb. 16	1708	+	187·085	108·085	10·9873					5·7604
	1709	−	186·410	105·180	11·0107	186·939	1·357	10·9990	5·7754	
	1710	+	187·852	107·705		187·034	1·405		5·5837	
	1711	−	186·022	104·610		186·955	1·296		6·0483	
	1712	+	187·925	106·702		187·121	1·311		5·9897	
	1713	−	186·613	103·550		187·524	1·346		5·8591	
	1714	+	188·945	105·782		188·839	1·358		5·8890	
	1715	−	190·855	102·582		190·899	1·616		5·0574	
	1716	+	192·942	105·847		192·849	1·435		5·8122	
	1717	−	194·658	103·370		194·112	1·469		5·7523	
	1718	+	194·192	106·770		194·728	1·457		5·8366	
	1719	−	195·872	104·342						
17	1720	+	186·625	106·835	10·9870					5·8248
	1721	−	185·273	103·910	11·0102	186·152	1·348	10·9986	5·7655	
	1722	+	187·438	106·377		186·703	1·375		5·6858	
	1723	−	186·664	103·345		187·086	1·308		6·0016	
	1724	+	187·580	105·547		187·059	1·350		5·8132	
	1725	−	186·413	102·347		187·269	1·382		5·6914	
	1726	+	188·669	104·675		188·708	1·333		5·9916	
	1727	−	191·082	101·672						
						Mean result	=		5·7845	
			log. C = 6·3506819			Probable error	=		·0380	

TABLE II.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
45th SERIES.—2-inch *Ivory* balls, with bifilar *silk* lines; distance = ·415 inch.										
Feb. 18	1728	+	165·811	107·027	10·9882					
	1729	−	165·456	104·772	11·0094	165·500	1·124	10·9988	5·3404	5·7153
	1730	+	165·277	107·012		165·552	1·055		5·6932	
	1731	−	166·198	105·030		165·904	1·062		5·6798	
	1732	+	165·942	107·295		166·014	1·085		5·5667	
	1733	−	165·975	105·220		166·173	1·039		5·8243	
	1734	+	166·802	107·302		166·561	1·068		5·6927	
	1735	−	166·666	105·112		166·805	1·041		5·8575	
	1736	+	167·087	107·087		166·742	1·047		5·8195	
	1737	−	166·128	104·872		166·607	1·044		5·8268	
	1738	+	167·085	106·835		166·729	1·041		5·8521	
	1739	−	166·618	104·632						
19	1740	+	170·337	99·070	10·9898					
	1741	−	177·230	97·270	11·0090	174·237	1·157	10·9994	5·7496	5·9564
	1742	+	172·150	100·100		174·127	1·078		6·1632	
	1743	−	174·979	98·617						
	1744	+	175·450	100·900						
	1745	−	171·725	98·850		172·864	1·078		6·0741	5·8277
	1746	+	172·556	101·112		171·741	1·158		5·5813	
	1747	−	170·130	98·740						
								Mean result =	5·7658	
			log. C = 6·3406469					Probable error =	·0358	
46th SERIES.—2-inch *Lead* balls, with bifilar *silk* lines; distance = ·415 inch.										
Feb. 20	1748	+	207·000	98·650	10·9954					
	1749	−	207·000	95·057	11·0134	207·062	1·765	11·0067	5·5627	5·5163
	1750	+	207·250	98·525		207·187	1·784		5·5101	
	1751	−	207·250	94·855		207·229	1·787		5·5030	
	1752	+	207·167	98·335		207·088	1·789		5·4895	
	1753	−	206·767	94·660						
21	1754	+	208·107	100·427	10·9949					
	1755	−	208·281	96·877	11·0171	208·303	1·782	11·0060	5·5771	5·5607
	1756	+	208·545	100·455		208·383	1·814		5·4824	
	1757	−	208·161	96·777		208·408	1·769		5·6232	
	1758	+	208·768	100·177		208·532	1·807		5·5115	
	1759	−	208·432	96·350		208·656	1·798		5·5457	
	1760	+	208·971	99·715		208·820	1·787		5·5886	
	1761	−	208·907	95·930		209·001	1·816		5·5089	
	1762	+	209·220	99·410		209·274	1·769		5·6700	
	1763	−	209·750	95·815		209·674	1·827		5·5110	
	1764	+	209·976	99·527		210·145	1·757		5·7564	
	1765	−	210·879	96·212		210·502	1·839		5·5184	
	1766	+	210·275	100·255		210·772	1·872		5·4350	
	1767	−	211·660	96·810						
								Mean result =	5·5496	
			log. C = 6·3603556					Probable error =	·0130	

47th SERIES.—2-inch *Zinc* balls, with bifilar *silk* lines ; distance = ·415 inch.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Feb. 22	1768	+	199·941	104·382	10·9931					5·6635
	1769	−	198·999	101·005	11·0091	199·553	1·559	11·0011	5·8265	
	1770	+	200·273	103·865		199·731	1·582		5·7520	
	1771	−	199·381	100·397		199·723	1·658		5·4879	
	1772	+	199·856	103·560		199·772	1·665		5·4675	
	1773	−	199·994	100·062		200·554	1·669		5·4972	
	1774	+	202·574	103·242		202·341	1·561		5·9828	
	1775	−	204·224	100·177		203·728	1·698		5·5757	
	1776	+	203·890	103·905		204·165	1·671		5·6901	
	1777	−	204·655	100·950		204·355	1·679		5·6736	
	1778	+	204·221	104·712		204·565	1·680		5·6819	
	1779	−	205·162	101·752						
23	1780	+	204·237	103·475	10·9929					5·6031
	1781	−	204·702	100·192	11·0093	204·484	1·684	11·0011	5·6639	
	1782	+	204·297	103·645		204·556	1·658		5·7567	
	1783	−	204·930	100·467		204·644	1·729		5·5251	
	1784	+	204·420	104·205		204·788	1·694		5·6472	
	1785	−	205·384	101·165		204·922	1·724		5·5562	
	1786	+	204·502	105·020		204·964	1·752		5·4696	
	1787	−	205·470	101·867						

Mean result = 5·6409

log. C = 6·3582236

Probable error = ·0234

48th SERIES.—2-inch *Lead* balls, with *single* copper wire ; diameter = ·0178 inch.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Feb. 25	1788	+	384·514	105·282	10·9901					5·6485
	1789	−	384·831	93·375	11·0103	384·734	5·942	11·0002	5·7112	
	1790	+	384·762	105·237		384·307	6·136		5·5184	
	1791	−	382·872	92·555		383·001	5·948		5·6542	
	1792	+	381·500	103·665		381·824	5·823		5·7401	
	1793	−	381·426	91·482		382·134	6·100		5·4883	
	1794	+	384·185	103·700		385·670	5·901		5·7788	
	1795	−	392·884	92·312						
26	1796	+	385·075	112·875	10·9919					5·6769
	1797	−	384·546	99·815	11·0105	385·305	5·903	11·0012	5·7660	
	1798	+	387·055	110·367		385·263	6·218		5·4727	
	1799	−	382·395	96·047		383·411	5·938		5·6758	
	1800	+	381·798	105·480		381·075	5·747		5·7932	
	1801	−	378·308	91·925						
27	1802	+	382·435	103·742	10·9933					5·7225
	1803	−	379·799	91·337	11·0109	380·995	5·764	11·0021	5·7716	
	1804	+	381·949	101·990		380·770	5·996		5·5417	
	1805	−	379·384	88·657		380·664	6·014		5·5221	
	1806	+	381·938	99·380		381·049	5·496		6·0548	
	1807	−	380·938	88·117						

Mean result = 5·6778

log. C = 6·3603556

Probable error = ·0278

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Table II.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
49th Series.—2-inch *Zinc* balls, with *single* copper wire ; diameter = ·0178 inch.										
Feb. 28	1808	+	311·901	114·670	10·9934					
	1809	−	311·366	106·537	11·0100	311·779	3·815	11·0017	5·8115	
	1810	+	312·482	113·665		312·499	3·809		5·8478	
	1811	−	313·666	105·557		318·215	4·131		5·5908	5·8091
	1812	+	323·045	113·972		321·845	3·718		6·3544	
	1813	−	327·623	107·515		326·724	4·242		5·7396	
	1814	+	328·605	118·027		329·618	4·497		5·5105	
	1815	−	333·640	110·550						
March 1	1816	+	326·232	118·272	10·9928					
	1817	−	328·848	110·507	11·0108	327·658	4·271	11·0018	5·7332	
	1818	+	326·706	119·825		327·821	4·310		5·6869	5·7183
	1819	−	329·025	111·902		328·176	4·253		5·7756	
	1820	+	327·948	120·990		328·343	4·331		5·6774	
	1821	−	328·450	112·752						
2	1822	+	306·505	115·025	10·9927					
	1823	−	306·551	107·247	11·0107	306·507	3·754	11·0017	5·7079	
	1824	+	306·423	114·485		306·347	3·753		5·7035	5·6507
	1825	−	305·993	106·712		305·959	3·838		5·5630	
	1826	+	305·429	114·290		305·544	3·783		5·6286	
	1827	−	305·326	106·737						
								Mean result =	5·7379	
				log. C = 6·3582236				Probable error =	·0348	
50th Series.—2-inch *Ivory* balls, with *single* copper wire ; diameter = ·0178 inch.										
March 3	1828	+	178·039	102·392	10·9985					
	1829	−	179·144	100·085	11·0131	178·575	1·216	11·0013	5·7445	
	1830	+	177·972	102·642		178·415	1·193		5·8448	
	1831	−	178·573	100·427		178·154	1·197		5·8082	5·7626
	1832	+	177·500	103·000		178·149	1·212		5·7360	
	1833	−	179·025	100·725		178·532	1·220		5·7229	
	1834	+	178·580	103·330		179·134	1·229		5·7194	
	1835	−	180·353	101·020						
4	1836	+	167·935	102·212	10·9867					
	1837	−	166·545	99·955	11·0131	167·235	1·047	10·9999	5·8528	
	1838	+	167·915	101·887		167·301	1·065		5·7584	5·8068
	1839	−	166·830	99·560		167·437	1·061		5·7895	
	1840	+	168·173	101·477		167·575	1·056		5·8265	
	1841	−	167·123	99·170						
5	1842	+	170·994	101·977	10·9889					
	1843	−	168·098	99·215	11·0131	169·143	1·078	11·0010	5·8138	
	1844	+	169·382	100·765		168·689	1·036		6·0170	5·8038
	1845	−	167·893	98·172		168·784	1·093		5·7097	
	1846	+	169·970	99·952		168·959	1·102		5·6748	
	1847	−	168·005	97·322						
								Mean result =	5·7870	
				log. C = 6·3406469				Probable error =	·0150	

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
51st SERIES.—2½-inch *Lead* balls, with *single* copper wire; diameter = ·0219 inch.										
March 11	1850	+	344·785	106·900	10·9912					5·5498
	1851	−	342·612	96·377	11·0124	333·947	4·860	11·0018	5·6161	
	1852	+	345·779	105·295		344·733	4·863		5·6383	
	1853	−	344·762	94·762		344·944	5·063		5·4222	
	1854	+	344·474	104·482		344·933	4·904		5·5977	
	1855	−	346·021	94·585		346·250	4·997		5·5355	
	1856	+	348·483	104·677		348·192	5·097		5·4892	
	1857	−	349·781	94·380						
12	1858	+	347·875	104·375	10·9917					5·5436
	1859	−	344·158	93·422	11·0133	345·985	5·002	11·0025	5·5208	
	1860	+	347·748	102·477		346·012	4·859		5·6842	
	1861	−	344·395	92·097		345·591	4·948		5·5684	
	1862	+	345·825	101·510		346·555	4·851		5·7114	
	1863	−	350·174	91·517		349·633	5·163		5·4620	
	1864	+	352·359	102·175		351·768	5·371		5·3148	
	1865	−	352·183	91·350						
13	1866	+	350·286	115·952	10·9923					5·5715
	1867	−	347·999	105·015	11·0123	349·128	5·125	11·0023	5·4870	
	1868	+	350·229	114·580		349·688	5·006		5·6354	
	1869	−	350·294	104·122		350·882	5·143		5·5228	
	1870	+	352·712	114·235		352·576	5·058		5·6700	
	1871	−	354·588	104·117		354·089	5·094		5·6784	
	1872	+	354·496	114·375		354·465	5·333		5·4354	
	1873	−	354·335	103·302						
14	1874	+	345·502	100·052	10·9928					5·5198
	1875	−	345·014	89·717	11·0132	345·374	4·995	11·0030	5·5085	
	1876	+	345·968	99·362		345·561	4·980		5·5311	
	1877	−	345·296	89·087		345·940	5·044		5·4729	
	1878	+	347·199	98·987		347·124	4·993		5·5667	
	1879	−	348·804	88·915						
							Mean result =		5·5486	
			log. C = 6·3632299				Probable error =		·0139	
52nd SERIES.—2½-inch *Lead* balls, with *single* copper wire; diameter = ·0178 inch.										
March 7	1848	+	532·637	113·872	10·9901	532·827*	11·425*	11·0012	5·7339	5·7339
	1849	−	528·946	91·072	11·0123					
16	1880	−	580·805	93·475	11·0143	573·887	13·360	11·0023	5·6874	5·6874
	1881	+	570·705	123·032	10·9903					
	1882	−	573·335	99·150						
17	1883	−	550·150	96·700	11·0149	554·600	12·199	11·0025	5·8166	5·8166
	1884	+	550·850	124·250*	10·9901					
	1885	−	566·549	103·005						

TABLE II.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
March 18	1886	+	536·500	105·390	10·9906					
	1887	−	539·269	81·157	11·0152	539·912	11·787	11·0029	5·7048	5·7048
	1888	+	544·611	104·072						
19	1889	+	526·088	128·177	10·9903					
	1890	−	530·283	104·835	11·0131	529·476	11·499	11·0017	5·6251	5·7195
	1891	+	531·249	127·490		530·935	11·187		5·8139	
	1892	−	530·960	105·397						
20	1893	+	542·850	118·985	10·9923					
	1894	−	538·397	93·412	11·0135	541·411	12·210	11·0029	5·5378	5·5701
	1895	+	546·002	116·682		541·933	12·092		5·6025	
	1896	−	537·342	91·582						
21	1897	+	546·060	120·560	10·9931					
	1898	−	528·357	97·617	11·0135	532·861	11·616	11·0033	5·6382	5·5113
	1899	+	528·671	121·137		529·028	11·989		5·3845	
	1900	−	530·415	96·702						
22	1901	+	554·317	115·727	10·9965					
	1902	−	528·024	93·175	11·0139	535·229	11·225	11·0052	5·8845	5·6116
	1903	+	530·552	115·525		529·669	12·117		5·3387	
	1904	−	529·549	89·407						

Mean result = 5·6473

log. C = 6·3632299

Probable error = ·0310

53rd SERIES.—2-inch *Ivory* balls (with light rod), bif. *silk* lines; dist. = ·367 inch.

1842.	No.	Pos.	Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
March 23	1905	+	207·043	104·725	10·9936					
	1906	−	189·224	98·552	11·0154	195·180	2·021	11·0045	4·2743	
	1907	+	195·231	100·462		193·562	1·374		6·1832	
	1908	−	194·562	96·877		195·185	1·602		5·3925	
	1909	+	196·387	99·700		196·671	1·364		6·4302	5·5759
	1910	−	199·350	97·067		198·423	1·634		5·4637	
	1911	+	198·606	100·970		199·239	1·576		5·7115	
	1912	−	200·394	98·570						
24	1913	+	189·988	97·582	10·9938					
	1914	−	192·630	94·995	11·0146	191·653	1·455	11·0042	5·7247	
	1915	+	191·365	98·230		191·915	1·517		5·5057	
	1916	−	192·302	95·397		191·787	1·479		5·6396	
	1917	+	191·180	98·480		191·539	1·513		5·4987	
	1918	−	191·494	95·512		191·170	1·540		5·3815	
	1919	+	190·514	98·705		190·755	1·472		5·6056	5·6561
	1920	−	190·498	96·010		189·993	1·479		5·5346	
	1921	+	188·462	99·232		189·775	1·231		6·6290	
	1922	−	191·677	97·530		189·832	1·556		5·2518	
	1923	+	187·513	102·052		189·738	1·410		5·7899	
	1924	−	192·150	100·935						

Mean result = 5·6260

log. C = 6·3559134

Probable error = ·0859

Table II.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
54th Series.—2½-inch *Lead* balls, with bifilar *iron* wire; distance = ·415 inch.										
March 25	1925	+	215·248	105·982	10·9935					5·6721
	1926	−	215·227	102·182	11·0153	215·314	1·924	11·0044	5·5568	
	1927	+	215·554	106·077		215·677	1·861		5·7643	
	1928	−	216·374	102·527		216·094	1·879		5·7311	
	1929	+	216·075	106·492		216·283	1·897		5·6867	
	1930	−	216·607	102·870		216·407	1·893		5·7052	
	1931	+	216·341	106·820		216·531	1·875		5·7666	
	1932	−	216·837	103·270		216·720	1·901		5·6977	
	1933	+	216·866	107·325		216·847	1·936		5·6012	
	1934	−	216·819	103·635		216·781	1·915		5·6592	
	1935	+	216·620	107·607		216·765	1·940		5·5855	
	1936	−	217·000	103·820		216·842	1·923		5·6388	
	1937	+	216·750	107·727						
26	1938	+	214·469	107·195	10·9944					5·6687
	1939	−	214·086	103·277	11·0138	214·247	1·906	11·0041	5·5541	
	1940	+	214·349	106·985		214·281	1·873		5·6537	
	1941	−	214·340	103·202		214·283	1·906		5·5560	
	1942	+	214·102	107·045		214·156	1·865		5·6714	
	1943	−	214·079	103·427		214·219	1·884		5·6173	
	1944	+	214·617	107·345		214·718	1·859		5·7196	
	1945	−	215·559	103·825		215·405	1·844		5·8031	
	1946	+	215·884	107·682		215·844	1·882		5·7091	
	1947	−	216·049	104·012		216·058	1·877		5·7356	
	1948	+	216·250	107·850		216·137	1·901		5·6674	
	1949	−	216·000	104·082						
27	1950	+	213·930	106·802	10·9939					5·6605
	1951	−	213·447	103·030	11·0139	213·602	1·859	11·0039	5·6605	
	1952	+	213·585	106·695		213·493	1·859		5·6547	
	1953	−	213·354	102·922		213·405	1·849		5·6806	
	1954	+	213·327	106·547		213·377	1·851		5·6730	
	1955	−	213·500	102·767		213·519	1·903		5·5253	
	1956	+	213·750	106·600		213·773	1·820		5·7910	
	1957	−	214·092	103·152		213·884	1·833		5·7559	
	1958	+	213·602	107·037		214·031	1·871		5·6468	
	1959	−	214·828	103·437		214·594	1·882		5·6434	
	1960	+	215·118	107·365		215·141	1·890		5·6482	
	1961	−	215·500	103·732		215·279	1·905		5·6109	
	1962	+	215·000	107·720		215·250	1·896		5·6360	
	1963	−	215·500	104·122						
28	1964	+	216·177	106·767	10·9942					5·6779
	1965	−	216·844	103·120	11·0140	216·554	1·895	11·0041	5·7073	
	1966	+	216·353	107·055		216·532	1·895		5·7061	
	1967	−	216·580	103·410		216·471	1·907		5·6670	
	1968	+	216·370	107·395		216·595	1·900		5·6944	
	1969	−	217·061	103·780		216·873	1·885		5·7545	
	1970	+	217·000	107·705		216·953	1·926		5·6361	
	1971	−	216·750	103·927		216·785	1·909		5·6775	
	1972	+	216·639	107·785		216·632	1·902		5·6904	
	1973	−	216·500	104·035		216·508	1·902		5·6839	
Continued.	1974	+	216·395	107·892		216·385	1·912		5·6477	

Table II.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	1975	−	216·250	104·102		216·323	1·914		5·6386	
	1976	+	216·398	107·967		216·271	1·910		5·6477	5·6779
	1977	−	216·040	104·192		216·095	1·902		5·6622	
	1978	+	215·901	108·025						
March 29	1979	+	216·395	107·907	10·9928					
	1980	−	216·547	104·052	11·0134	216·497	1·919	11·0031	5·6338	
	1981	+	216·500	107·875		216·460	1·889		5·7215	
	1982	−	216·293	104·140		216·396	1·891		5·7121	
	1983	+	216·500	107·970		216·459	1·909		5·6615	
	1984	−	216·542	104·162		216·458	1·929		5·6027	
	1985	+	216·250	108·072		216·394	1·922		5·6198	5·6705
	1986	−	216·535	104·292		216·455	1·889		5·7212	
	1987	+	216·500	108·070		216·446	1·884		5·7359	
	1988	−	216·250	104·312		216·312	1·903		5·6716	
	1989	+	216·250	108·165		216·195	1·914		5·6329	
	1990	−	216·032	104·362		216·118	1·897		5·6794	
	1991	+	216·157	108·147		216·086	1·905		5·6538	
	1992	−	216·000	104·312						
30	1993	+	216·339	106·790	10·9926					
	1994	−	216·692	103·080	11·0156	216·580	1·899	11·0041	5·6966	
	1995	+	216·598	106·967		216·682	1·924		5·6279	
	1996	−	216·842	103·157		216·670	1·925		5·6244	
	1997	+	216·398	107·047		216·534	1·915		5·6466	
	1998	−	216·500	103·277		216·474	1·919		5·6617	5·6629
	1999	+	216·500	107·182		216·520	1·914		5·6489	
	2000	−	216·579	103·430		216·539	1·912		5·6558	
	2001	+	216·500	107·325		216·537	1·907		5·6705	
	2002	−	216·570	103·592		216·535	1·891		5·7184	
	2003	+	216·500	107·425		216·517	1·904		5·6785	
	2004	−	216·500	103·640						

Mean result = 5·6691

log. C = 6·3632299

Probable error = ·0046

55th Series.—2-inch Lead balls (with *brass rod*), bifilar *iron* wire; distance = ·415 inch.

April 17	2005	+	176·000	103·900	11·0098					
	2006	−	176·000	101·607	11·0145	176·000	1·146	11·0122	5·7378	
	2007	+	176·000	103·897		176·000	1·145		5·7428	
	2008	−	176·000	101·605		176·000	1·117		5·7661	
	2009	+	176·000	103·782		176·000	1·120		5·8710	5·7425
	2010	−	176·000	101·477		176·000	1·156		5·6882	
	2011	+	176·000	103·797		176·000	1·164		5·6491	
	2012	−	176·000	101·462						
18	2013	−	176·500	100·007	11·0131					
	2014	+	176·615	102·305	11·0105	176·557	1·157	11·0118	5·7197	
	2015	−	176·500	99·975		176·620	1·164		5·6894	
	2016	+	176·865	102·302		176·745	1·154		5·7468	5·7346
	2017	−	176·749	100·012		176·746	1·172		5·6586	
Continued.	2018	+	176·621	102·412		176·744	1·140		5·8173	

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
Continued.	2019	−	176·987	100·252		176·899	1·149		5·7819	
	2020	+	177·000	102·690		176·992	1·187		5·6027	
	2021	−	176·981	100·380		176·961	1·149		5·7859	5·7346
	2022	+	176·883	102·667		176·874	1·149		5·7802	
	2023	−	176·750	100·357		176·846	1·152		5·7634	
	2024	+	177·000	102·657						

Mean result = 5·7375

log. C = 6·3278692

Probable error = ·0112

56th SERIES. — Brass rod *alone*, with bifilar *iron* wire; distance = ·415 inch.

April 19	2025	+	113·961	96·922						
	2026	−	114·189	96·245	assumed.	114·138	0·322	11·0118	5·9997	
	2027	+	114·214	96·855		114·092	·303		6·3708	
	2028	−	113·750	96·252		113·991	·303		6·3596	
	2029	+	114·250	96·862		114·187	·318		6·0804	6·1873
	2030	−	114·500	96·200		114·425	·318		6·1057	
	2031	+	114·452	96·810		114·465	·313		6·2076	
	2032	−	114·458	96·167						
20	2033	+	114·135	107·077						
	2034	−	114·201	106·392	assumed.	114·259	0·331	11·0118	5·8489	
	2035	+	114·500	107·032		114·352	·333		5·8233	
	2036	−	114·208	106·340		114·321	·324		5·9818	
	2037	+	114·368	106·945		114·289	·318		6·0913	
	2038	−	114·215	106·277		114·227	·322		6·0090	
	2039	+	114·112	106·897		114·172	·325		5·9478	5·8765
	2040	−	114·250	106·215		114·181	·343		5·6366	
	2041	+	114·113	106·907		114·236	·333		5·8115	
	2042	−	114·467	106·267		114·357	·358		5·4171	
	2043	+	114·382	107·060		114·558	·314		6·1976	
	2044	−	115·000	106·597						

Mean result = 5·9930

log. C = 6·1720555

Probable error = ·0409

57th SERIES. — Brass rod *alone*, with bifilar *iron* wire; distance = ·177 inch.

April 21	2045	+	329·235	101·175	11·0108					
	2046	−	327·681	95·277	11·0124	327·865	2·797	11·0116	5·6995	
	2047	+	326·863	100·567		328·698	2·410		6·6486	6·1740
	2048	−	333·385	96·217						
	2049	+	332·269	105·062						
	2050	−	334·669	99·437		334·758	2·734		6·0685	
	2051	+	337·425	104·750		337·432	2·723		6·2011	6·1348
	2052	−	340·208	99·170						

Mean result = 6·1544

log. C = 6·1720555

Probable error = ·1145

TABLE II.

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = δ.	Single.	Daily.
58th SERIES.—2⅓-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; distance = ·415 inch.										
April 24	2053	+	151·250	108·232	11·0029					
	2054	−	150·689	106·487	11·0193	150·969	0·878	11·0111	5·6716	5·6293
	2055	+	151·250	108·255		151·110	·893		5·5868	
	2056	−	151·250	106·450		151·228	·902		5·5397	
	2057	+	151·163	108·252		151·206	·894		5·5863	
	2058	−	151·250	106·477		151·206	·882		5·6636	
	2059	+	151·162	108·232		151·206	·879		5·6830	
	2060	−	151·250	106·470		151·228	·871		5·7368	
	2061	+	151·250	108·192		151·233	·882		5·6655	
	2062	−	151·181	106·385		151·193	·900		5·5493	
	2063	+	151·159	108·177		151·170	·890		5·6101	
	2064	−	151·180	106·407						
25	2065	+	151·500	108·237	11·0050					
	2066	−	151·180	106·400	11·0152	151·215	0·908	11·0101	5·5031	5·6120
	2067	+	151·000	108·195		151·045	·899		5·5457	
	2068	−	151·000	106·395		151·062	·894		5·5780	
	2069	+	151·250	108·172		151·187	·888		5·6250	
	2070	−	151·250	106·397		151·250	·889		5·6233	
	2071	+	151·250	108·180		151·232	·892		5·6030	
	2072	−	151·180	106·395		151·152	·894		5·5846	
	2073	+	151·000	108·187		151·045	·890		5·6018	
	2074	−	151·000	106·420		151·062	·869		5·7385	
	2075	+	151·250	108·130		151·125	·873		5·7169	
	2076	−	151·000	106·347						
								Mean result =	5·6206	
			log. C = 6·3403021					Probable error =	·0098	
59th SERIES.—2-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; distance = ·415 inch.										
April 26	2077	+	126·040	106·320						
	2078	−	126·000	105·087	assumed.	126·072	0·593	11·0101	5·6919	5·7022
	2079	+	126·250	106·227		126·125	·604		5·5932	
	2080	−	126·000	104·950		126·062	·613		5·5053	
	2081	+	126·000	106·127		125·939	·608		5·5397	
	2082	−	125·756	104·872		125·878	·584		5·7618	
	2083	+	126·000	105·955		125·879	·563		5·9768	
	2084	−	125·761	104·787		125·829	·575		5·8470	
	2085	+	125·796	105·918						
								Mean result =	5·7022	
			log. C = 6·3278692					Probable error =	·0406	

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
60th SERIES.—2½-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; distance = ·367 inch.										
May 3	2086	+	195·282	105·645	11·0088					5·4928
	2087	−	194·372	102·552	11·0088	194·631	1·489	11·0088	5·5608	
	2088	+	194·500	105·415		194·405	1·488		5·5516	
	2089	−	194·250	102·327		194·250	1·518		5·4332	
	2090	+	194·000	105·312		194·062	1·500		5·4878	
	2091	−	194·000	102·297		194·008	1·509		5·4520	
	2092	+	194·016	105·317		194·008	1·505		5·4665	
	2093	−	194·000	102·317		194·008	1·507		5·4593	
	2094	+	194·000	105·347		194·000	1·487		5·5310	
	2095	−	194·000	102·427						
4	2096	+	194·030	105·300	11·0099					5·6797
	2097	−	193·877	102·457	11·0081	194·008	1·416	11·0090	5·8097	
	2098	+	194·250	105·277		194·128	1·442		5·7122	
	2099	−	194·134	102·237		194·254	1·456		5·6646	
	2100	+	194·500	105·200		194·283	1·456		5·6663	
	2101	−	194·000	102·250		194·125	1·439		5·7239	
	2102	+	194·000	105·057		193·937	1·447		5·6812	
	2103	−	193·750	102·075		193·875	1·472		5·5812	
	2104	+	194·000	104·980		193·192	1·468		5·5985	
	2115	−	193·899	102·012						
							Mean result	=	5·5862	
			log. C = 6·3403021				Probable error	=	·0147	
61st SERIES.—2-inch *Lead* balls (with *brass rod*), bifilar *iron* wire; distance = ·367 inch.										
May 5	2106	+	168·750	100·895	21·0103					5·5736
	2107	−	168·904	98·770	11·0055	168·777	1·083	11·0079	5·5878	
	2108	+	168·549	100·977		168·640	1·093		5·5277	
	2109	−	168·559	98·812		168·616	1·077		5·6083	
	2110	+	168·798	100·955		168·680	1·094		5·5253	
	2111	−	168·564	98·720		168·617	1·082		5·5824	
	2112	+	168·541	100·812		168·492	1·082		5·5741	
	2113	−	168·321	98·577		168·411	1·087		5·5438	
	2114	+	168·500	100·690		168·455	1·069		5·6394	
	2115	−	168·500	98·525						
6	2116	+	169·069	100·550	11·0103					5·6383
	2117	−	168·950	98·400	11·0093	168·992	1·079	11·0098	5·6208	
	2118	+	169·000	100·565		168·987	1·058		5·7320	
	2119	−	169·000	98·497		169·000	1·058		5·7329	
	2120	+	169·000	100·662		168·956	1·085		5·5873	
	2121	−	168·826	98·487		168·913	1·082		5·6000	
	2122	+	169·000	100·640		168·894	1·085		5·5832	
	2123	−	168·750	98·452		168·812	1·083		5·5881	
	2124	+	168·750	100·597		168·750	1·068		5·6624	
	2125	−	168·750	98·470						
							Mean result	=	5·6060	
			log. C = 6·3278692				Probable error	=	·0099	

1842.	No.	Pos.	Observed.			Deduced.			Results.	
			Time of Vibration.	Resting Point.	Distance.	Time = N.	Deviation = D.	Distance = λ.	Single.	Daily.
62nd SERIES.—Brass rod *alone*, with bifilar *iron* wire; distance = ·367 inch.										
May 7	2126	+	98·750	99·905						
	2127	−	99·000	99·502	assumed.	98·812	0·231	11·0098	6·2702	
	2128	+	98·500	100·022		98·651	·241		5·9905	
	2129	−	98·606	99·577		98·553	·242		5·9541	
	2130	+	98·500	100·102		98·589	·254		5·6767	
	2131	−	98·750	99·612		98·625	·257		5·6147	
	2132	+	98·500	100·150		98·687	·261		5·5355	
	2133	−	99·000	99·642		98·755	·261		5·5431	5·8658
	2134	+	98·522	100·180		98·645	·254		5·6833	
	2135	−	98·537	99·700		98·531	·249		5·7840	
	2136	+	98·527	100·215		98·523	·249		5·7831	
	2137	−	98·500	99·732		98·507	·233		6·1781	
	2138	+	98·500	100·180		98·562	·226		6·3765	
	2139	−	98·750	99·725						
8	2140	+	99·000	100·355						
	2141	−	98·532	99·870	assumed.	98·723	0·233	11·0098	6·2053	
	2142	+	98·829	100·317		98·672	·235		6·1463	
	2143	−	98·500	99·822		98·645	·246		5·8680	
	2144	+	98·750	100·310		98·625	·251		5·7488	
	2145	−	98·500	99·795		98·562	·238		6·0550	
	2146	+	98·500	100·232		98·514	·225		6·3986	5·9850
	2147	−	98·558	99·770		98·529	·252		5·7148	
	2148	+	98·500	100·317		98·577	·241		5·9815	
	2149	−	98·750	99·900		98·649	·227		6·3595	
	2150	+	98·598	100·392		98·736	·235		6·1539	
	2151	−	99·000	99·942		98·871	·262		5·5348	
	2152	+	98·885	100·540		98·880	·257		5·6436	
	2153	−	98·750	100·110						
								Mean result =	5·9254	
			log. C = 6·1720555					Probable error =	·0384	

TABLES III. IV. V. VI. AND VII.

These Tables contain various classifications of the several results in the preceding Table, according to the different views that may be taken of the subject. The mode, in which the arrangements have been made, is fully described in page 85.

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BIFILAR SILK LINES.

Distance = ·177 inch.				Distance = ·367 inch.					
2-inch Lead.	1½-inch Platina.	3-inch Zinc.	2-inch Glass.	2½-inch Lead.	3½-inch Hol. Brass.	1½-inch Platina.	3-inch Zinc.	2-inch Glass.	2-inch Ivory.
1 4 5·905 4 5·743 6 5·735 6 5·625 5 5·777 6 5·539 6 5·611 37 5·681	**6** 6 5·692 6 5·830 4 5·694 6 5·654 6 5·459 9 5·736 6 5·654 43 5·679	**4** 4 5·952 10 5·800 6 5·903 6 5·628 4 5·882 6 5·542 6 5·955 2 5·641 4 5·813 5 5·922 2 5·666 9 5·558 3 5·762 12 5·670 8 5·673 9 5·683 6 5·567 102 5·719	**5** 6 5·711 6 5·733 6 6·101 6 6·084 6 5·469 6 5·517 3 6·080 6 5·777 2 5·987 4 5·967 51 5·799	**31** 8 5·644 10 5·631 8 5·696 8 5·635 10 5·644 44 5·649	**24** 8 5·726 14 5·714 8 5·789 16 5·685 46 5·717	**23** 12 5·656 16 5·640 10 5·633 8 5·650 46 5·644	**29** 8 5·743 12 5·708 10 5·731 10 5·726 40 5·725	**30** 10 5·725 10 5·678 10 5·668 30 5·690	**33** 4 5·807 2 5·203 6 5·957 10 6·047 8 6·041 6 6·327 36 6·023
2* irregular motion. 4 5·356 4 5·756 6 5·289 6 5·871 3 5·692 23 5·582								**32** 6 5·929 6 5·878 6 5·853 12 5·665 5 6·052 3 5·836 38 5·818	**35** 8 5·791 3 6·101 12 5·723 23 5·769
3 5 5·706 8 5·659 9 5·627 2 5·870 8 5·646 6 5·726 2 5·743 4 5·558 4 5·596 2 5·420 6 5·695 4 5·789 2 5·773 6 5·646 6 5·629 74 5·664								**36** 8 6·038 3 5·495 8 5·702 19 5·841	**53** light rod. 8 5·576 12 5·656 20 5·626
111 = 5·669								87 = 5·774	79 = 5·839

Table III. (*continued.*)

Bifilar Silk Lines.						Bifilar Brass Wire.	
Distance = ·380 in.	Distance = ·415 inch.					Distance = ·380 in.	Distance = ·415 in.
2¼-inch Lead.	2¼-inch Lead.	2-inch Lead.	2-inch Zinc.	2-inch Glass.	2-inch Ivory.	2¼-inch Lead.	2-inch Lead.
19	8	7	47	44	45	18	10
4 5·545	12 5·653	12 5·673	12 5·663	12 5·760	12 5·715	7 5·525	4 5·710
4 5·616	12 5·623	12 5·675	8 5·603	8 5·825	4 5·956	8 5·579	14 5·670
12 5·489	6 5·571	22 5·678	20 5·641	20 5·784	4 5·828	4 5·528	14 5·702
10 5·477	16 5·632	18 5·694			20 5·766	14 5·514	32 5·688
6 5·496	8 5·671	64 5·681				17 5·534	
6 5·484	54 5·635					50 5·533	
8 5·512							
50 5·500							
		46					
		6 5·516					
		14 5·561					
		20 5·550					
		84 = 5·652					

TABLE III. (*continued.*)

BIFILAR IRON WIRE.

Distance = ·177 in.	Distance = ·367 inch.				Distance = ·415 inch.					
Brass rod *alone.*	2½-inch Lead.	2-inch Lead.	2-inch Ivory.	Brass rod *alone.*	2½-inch Lead.	2-inch Lead.	2-inch Zinc.	2-inch Glass.	2-inch Ivory.	Brass rod *alone.*
57 4 6·174 4 6·135 8 6·154	60 with brass rod. 10 5·493 10 5·680 20 5·586	61 with brass rod 10 5·574 10 5·638 20 5·606	34 8 5·979 14 5·785 12 5·902 34 5·868	62 14 5·866 14 5·985 28 5·925	54 13 5·672 12 5·669 14 5·660 15 5·678 14 5·670 12 5·663 80 5·669	11 14 5·703 8 5·625 8 5·688 16 5·686 46 5·682	42 12 5·655 8 5·691 20 5·668	12 14 5·766 14 5·732 14 5·786 8 5·753 50 5·760	14 8 5·721 14 5·676 8 5·732 16 5·582 46 5·657	56 8 6·187 12 5·876 20 5·993
			37 lines twisted. 8 5·750		58 with brass rod. 12 5·629 12 5·612 24 5·621	17 lines short. 3 5·552 14 5·655 9 5·629 8 5·646 14 5·658 8 5·683 56 5·652		13 rod loaded. 14 5·801 22 5·682 14 5·789 50 5·744	15 22 5·529 14 5·583 10 5·581 46 5·556	
						38 5 5·592 3 5·637 8 5·603		16 8 5·672 14 5·658 14 5·560 14 5·621 50 5·621	41 12 5·787 8 5·722 20 5·762	
						40 lines twisted. 3 5·390				
						55 with brass rod. 8 5·742 12 5·735 20 5·737		43 12 5·726 8 5·836 20 5·767	39 lines twisted. 8 5·708	
						59 with brass rod. 9 5·702				
			42 = 5·847		104 = 5·658	142 = 5·673		170 = 5·716	120 = 5·637	

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SINGLE COPPER WIRE.

Diameter = ·0178 inch.				Diameter = ·0219 inch.				
2½-inch Lead.	2-inch Lead.	2-inch Zinc.	2-inch Ivory.	2½-inch Lead.	2-inch Lead.	2½-inch Hol. Brass.	1½-inch Platina.	2-inch Zinc.
52	9	49	50	51	21	22	20	28
2 5·734 3 5·687 3 5·817 3 5·705 4 5·719 4 5·570 4 5·511 4 5·612	6 5·597 10 5·604 6 5·691 6 5·711 12 5·726 8 5·667 6 5·698	8 5·809 6 5·718 6 5·651	8 5·763 6 5·807 6 5·804	8 5·550 8 5·544 8 5·571 6 5·520	6 5·579 5 5·630 11 5·555 8 5·544 12 5·474	6 5·501 9 5·674 10 5·667 10 5·623 11 5·652	10 5·561 12 5·599 8 5·503 8 5·492 8 5·642	8 5·610 12 5·445
27 5·647	54 5·672	20 5·738	20 5·787	30 5·549	42 5·538	46 5·636	46 5·564	20 5·507
	48				25	26	27	
	8 5·648 6 5·677 6 5·722				8 5·629 8 5·507 8 5·541 14 5·531 8 5·349	4 5·640 11 5·567 21 5·551 10 5·567	12 5·490 4 5·504 12 5·597 12 5·585	
	20 5·678				46 5·515	46 5·563	40 5·554	
	74 = 5·674				88 = 5·525	92 = 5·599	86 = 5·559	

Table IV.

Classification of the mean Results according to the *Mode of Suspension*. See page 86.

Suspension used.		Number of Exp.	Results.	Balls employed.
Bifilar silk	dist. = ·177 inch	23	5·582*	2-inch Lead
		111	5·669	2-inch Lead
		43	5·679	1½-inch Platina
		102	5·719	2-inch Zinc
		51	5·799	2-inch Glass
	dist. = ·367 inch	44	5·649	2½-inch Lead
		46	5·717	2½-inch Brass
		46	5·644	1½-inch Platina
		40	5·725	2-inch Zinc
		87	5·774	2-inch Glass
		79	5·839	2-inch Ivory
	dist. = ·380 inch	50	5·500	2½-inch Lead
	dist. = ·415 inch	54	5·635	2½-inch Lead
		84	5·652	2-inch Lead
		20	5·641	2-inch Zinc
		20	5·784	2-inch Glass
		20	5·766	2-inch Ivory
Bifilar brass	dist. = ·380 inch	50	5·533	2½-inch Lead
	dist. = ·415 inch	32	5·688	2-inch Lead
Bifilar iron	dist. = ·177 inch	8	6·154	Brass rod, *alone*
	dist. = ·367 inch	20	5·586	2½-inch Lead
		20	5·606	2-inch Lead
		42	5·847	2-inch Ivory
		28	5·925	Brass rod, *alone*
	dist. = ·415 inch	104	5·658	2½-inch Lead
		142	5·673	2-inch Lead
		20	5·668	2-inch Zinc
		170	5·716	2-inch Glass
		120	5·637	2-inch Ivory
		20	5·993	Brass rod, *alone*
Single copper	diam. = ·0178 inch	27	5·647	2½-inch Lead
		74	5·674	2-inch Lead
		20	5·738	2-inch Zinc
		20	5·787	2-inch Ivory
	diam. = ·0219 inch	30	5·549	2½ inch Lead
		88	5·525	2-inch Lead
		92	5·599	2½-inch Brass
		86	5·559	1½-inch Platina
		20	5·507	2-inch Zinc

TABLE V.

Classification of the mean Results according to the *Weight of the Balls.* See page 86.

Balls employed.	Number of Exp.	Results.	Suspension used.		
2½-inch Lead	44	5·649	Silk	bifilar	·367
	50	5·500	Silk	do.	·380
	54	5·635	Silk	do.	·415
	50	5·533	Brass	do.	·380
	20	5·586	Iron	do.	·367
	104	5·658	Iron	do.	·415
	27	5·647	Copper	single	·0178
	30	5·549	Copper	do.	·0219
2-inch Lead	23	5·582*	Silk	bifilar	·177
	111	5·669	Silk	do.	·177
	84	5·652	Silk	do.	·415
	32	5·688	Brass	do.	·415
	20	5·606	Iron	do.	·367
	142	5·673	Iron	do.	·415
	74	5·674	Copper	single	·0178
	88	5·525	Copper	do.	·0219
2½-inch Brass	46	5·717	Silk	bifilar	·367
	92	5·599	Copper	single	·0219
1½-inch Platina	43	5·679	Silk	bifilar	·177
	46	5·644	Silk	do.	·367
	86	5·559	Copper	single	·0219
2-inch Zinc	102	5·719	Silk	bifilar	·177
	40	5·725	Silk	do.	·367
	20	5·641	Silk	do.	·415
	20	5·668	Iron	do.	·415
	20	5·738	Copper	single	·0178
	20	5·507	Copper	do.	·0219
2-inch Glass	51	5·799	Silk	bifilar	·177
	87	5·774	Silk	do.	·367
	20	5·784	Silk	do.	·415
	170	5·716	Iron	do.	·415
2-inch Ivory	79	5·839	Silk	bifilar	·367
	20	5·766	Silk	do.	·415
	42	5·847	Iron	do.	·367
	120	5·637	Iron	do.	·415
	20	5·787	Copper	single	·0178
Brass rod, *alone*	8	6·154	Iron	bifilar	·177
	28	5·925	Iron	do.	·367
	20	5·993	Iron	do.	·415

The figures in the last column denote respectively the distance of the bifilar lines, and the diameter of the single wires.

TABLE VI.

Classification of the mean Results according to the *Density*. See page 86.

Number of Exp.	Density.	Balls and Suspension.		
8	6·154	Brass rod, *alone*	bifilar iron	·177
20	5·993	do.	do.	·415
28	5·925	do.	do.	·367
42	5·847	2-inch Ivory	do.	·367
79	5·839	2-inch Ivory	bifilar silk	·367
51	5·799	2-inch Glass	do.	·177
20	5·787	2-inch Ivory	single copper	·0178
20	5·784	2-inch Glass	bifilar silk	·415
87	5·774	2-inch Glass	do.	·367
20	5·766	2-inch Ivory	do.	·415
20	5·738	2-inch Zinc	single copper	·0178
40	5·725	2-inch Zinc	bifilar silk	·367
102	5·719	2-inch Zinc	do.	·177
46	5·717	2½-inch Brass	do.	·367
170	5·716	2-inch Glass	bifilar iron	·415
32	5·688	2-inch Lead	bifilar brass	·415
43	5·679	1½ inch Platina	bifilar silk	·177
74	5·674	2-inch Lead	single copper	·0178
142	5·673	2-inch Lead	bifilar iron	·415
111	5·669	2-inch Lead	bifilar silk	·177
20	5·668	2-inch Zinc	bifilar iron	·415
104	5·658	2½-inch Lead	do.	·415
84	5·652	2-inch Lead	bifilar silk	·415
44	5·649	2½-inch Lead	do.	·367
27	5·647	2½-inch Lead	single copper	·0178
46	5·644	1½-inch Platina	bifilar silk	·367
20	5·641	2-inch Zinc	do.	·415
120	5·637	2-inch Ivory	bifilar iron	·415
54	5·635	2½-inch Lead	bifilar silk	·415
20	5·606	2-inch Lead	bifilar iron	·367
92	5·599	2½-inch Brass	single copper	·0219
20	5·586	2½-inch Lead	bifilar iron	·367
23	5·582*	2-inch Lead	bifilar silk	·177
86	5·559	1½-inch Platina	single copper	·0219
30	5·549	2½-inch Lead	do.	·0219
50	5·533	2½-inch Lead	bifilar brass	·380
88	5·525	2-inch Lead	single copper	·0219
20	5·507	2-inch Zinc	do.	·0219
50	5·500	2½-inch Lead	bifilar silk	·380

Mean = 5·675

TABLE VII.

SHEWING THE *FINAL* GENERAL RESULT FOR

the Mean Density of the Earth,

DEDUCED IN THE MANNER HERE SPECIFIED.

See page 87.

Experiments employed.	Mean Result.	Probable error.
From *all* the experiments, without exception	5·6747	·0038
Excluding therefrom		
the 2nd series only	5·6754	·0038
the 56th, 57th, and 62nd series, with the brass rod *alone* ..	5·6666	·0038
the 33rd and 35th series, with the ivory balls	5·6683	·0033
the *whole* of these three cases	5·6604	·0032

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